DOCUMENT RESUME

ED 216 128 CE 032 081

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TITLE	Masonry. Post Secondary Curriculum Guide.
INSTITUTION	Georgia Univ., Athens. Div. of Vocational Education.
SPONS AGENCY	Georgia State Dept. of Education, Atlanta. Office of Vocational Education.
PUB DATE	81
NOTE	257p.
EDRS PRICE	MF01/PC11 Plus Postage.
DESCRIPTORS	Behavioral Objectives; Disabilities; Educational Resources; Employment Potential; Experiential Learning; Facility Guidelines; Job Skills; *Learning Activities; Mainstreaming; *Masonry; Occupational Information; Postsecondary Education; Special Education; State Curriculum Guides; *Trade and Industrial Education; Units of Study; Vocational Education

ABSTRACT

This curriculum guide was designed for use in postsecondary masonry education programs in Georgia. Its purpose is to provide for the development of entry level skills in masonry in the areas of knowledge, theoretical structure, tool usage, diagnostic ability, related supportive skills, and occupational survival skills. The first two sections of 10 explain the philosophy and objectives of state and local vocational education, and of the guide. In section 3, the occupational field of masonry is described; and employability skills, student exit points, and tasks cross referenced to the Dictionary of Occupational Titles are listed. The curriculum structure and course outline are provided in section 4, while section 5, the main part of the guide, provides unit guides for each task to be taught. (For each task, a task description, student performance objective, suggested instructional activities, instructional materials, evaluation sections, suggested classroom hours, and related instruction tasks are included.) Section 4 contains references and resources, while student record forms comprise section 7. Following suggestions for working with special needs students (section 4), the guide concludes with a facility layout for a learning resource center and a laboratory, and definitions of terms (sections 9 and 10). (KC)

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MASONRY

Post Secondary

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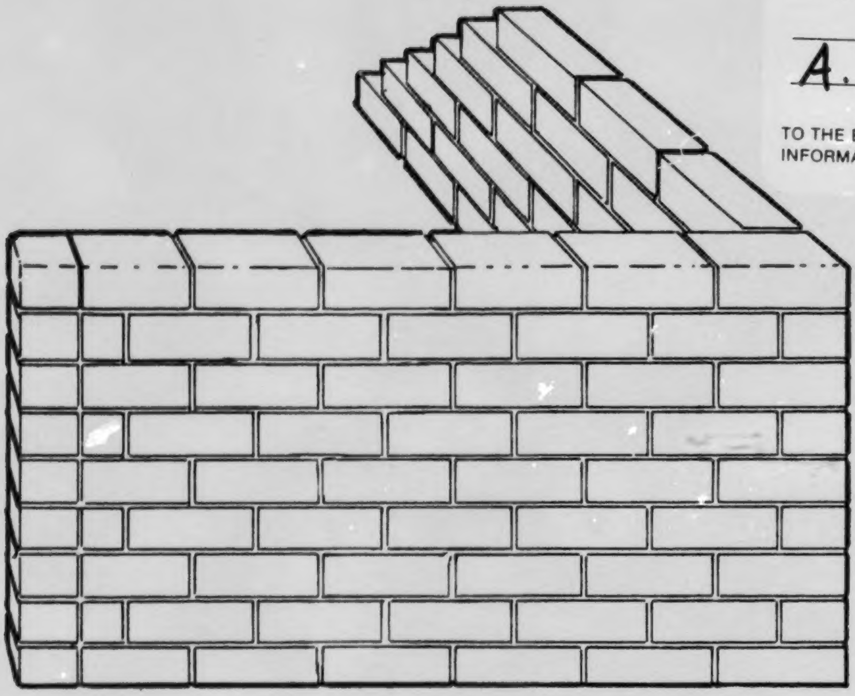

CE 032 081

CURRICULUM GUIDE

Georgia Department of Education

MASONRY

Developed Under Contractual Agreement with

Division of Program Development
Office of Vocational Education
Georgia Department of Education
Atlanta, Georgia 30334
Charles McDaniel, State Superintendent of Schools
1981

MASONRY

Developed By

The University of Georgia

Under the Direction of

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POLICIES AND PROCEDURES FOR THE CENTER

PURPOSE OF THE CENTER

The Vocational Education Materials Center functions within the Division of Vocational Education, University of Georgia. This Center operates under grants from the U.S. Office of Education, and the Georgia State Department of Education with the support of the College of Education. The Center is comprehensive in its commitment and approach to the development and dissemination of materials in the broad field of Vocational Education.

The purpose of the Center is to increase the capability of Georgia's delivery system for Vocational Education. Specifically, the Center is committed to:

1. Develop materials to assist in the implementation of proposed curricula and to enhance the teaching of Vocational Education.
2. Conduct and report curriculum research related to Vocational Education.
3. Provide a production and dissemination center for Vocational Education materials.
4. Provide direct experiences in curriculum development and diffusion for advanced graduate students.
5. Enable faculty members to participate in the development and implementation of a variety of curriculum materials.

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TABLE OF CONTENTS

SECTION I: PHILOSOPHY AND GOALS (Pink) I-1

State I-3

Local I-5

SECTION II: PURPOSE AND OBJECTIVE (Blue) II-1

Purpose of Guide II-3

Program Objective II-5

SECTION III: D.O.T. DESCRIPTION, EXIT POINTS, TASK (Green) III-1

Description of Occupational Field III-3

Employability Skills III-9

Student Exit Points III-10

Task Listing/D.O.T. Code Cross Reference III-12

SECTION IV: CURRICULUM STRUCTURE AND COURSE OUTLINE (Yellow) IV-1

Curriculum Structure IV-3

Course Outline IV-7

SECTION V: UNIT GUIDES (Gold) V-1

SECTION VI: REFERENCES, RESOURCES (Pink) VI-1

Instructional Resource Matrix VI-3

Additional Instructional Resources VI-13

Publishers and Manufacturers VI-16

SECTION VII: STUDENT RECORDS (Blue) VII-1

Individual Progress Reports VII-5

Group Progress Reports VII-6

Student Competency Record VII-7

SECTION VIII: SPECIAL NEEDS STUDENTS (Green)........ VIII-1

Working with the Special Needs Student VIII-3

SECTION IX: FACILITY LAYOUT (Yellow) IX-1

Learning Resource Center IX-4

Laboratory IX-7

SECTION X: DEFINITION OF TERMS (Gold) X-1

SECTION I

PHILOSOPHY & GOALS

VOCATIONAL EDUCATION IN GEORGIA

A. PHILOSOPHY

The Georgia Board of Education perceives vocational education as a vital component in the education of the young and adult citizens of this State. Appropriate programs of vocational education and ancillary services should be made readily available to individuals in middle schools, high schools, postsecondary area vocational-technical schools, vocational divisions of junior colleges, vocational centers, the Quick Start program and other adult programs designed to train or retrain workers for useful and satisfying employment.

Special services and assistance must be provided to those who need it in order to participate or benefit from vocational education. This includes women, minorities, the displaced homemaker and other displaced workers, those with limited English-speaking ability, the disadvantaged and the handicapped.

Since men and women spend the greater part of their lives at some form of work, the State should provide opportunities for all its citizens to develop the knowledge, skills and attitudes necessary for them to secure personally satisfying and socially useful employment.

B. PURPOSE

The purpose of vocational education shall be to improve the economic well-being of Georgia citizens by preparing individuals, through organized learning experiences, to select, obtain and advance in recognized occupations.

POSTSECONDARY VOCATIONAL EDUCATION

A. PURPOSE

The purpose of postsecondary vocational-technical education in Georgia is to improve the economic well-being of adult citizens by providing access to high quality vocational-technical training for skilled and semi-skilled occupations, for improvement of existing skills or for retraining in a new occupation.

B. OBJECTIVES

1. To provide vocational-technical education programs and ancillary services commensurate with the needs and interests of students and available job opportunities.
2. To provide vocational-technical education programs which are current with the state-of-the-art, competency-based, and offer multiple exit points to accomodate the students' occupational objectives.
3. To provide vocational-technical education programs which are articulated with available high school counterparts, to facilitate an easy transition from secondary to postsecondary levels without loss of credit.
4. To provide vocational-technical education programs such that 75% of those individuals who leave or complete a program of occupational preparation will find employment in the field, or a related field, for which trained.
5. To provide those guidance, counseling, financial aid, evaluative, job placement, remedial and other supportive programs and services needed by students to enroll, complete a program and become, or remain, employable in a skilled or semi-skilled occupation.
6. To provide needed assistance to special populations to include women, minorities, limited English-speaking, the displaced homemaker and other displaced workers, the disadvantaged and the handicapped.
7. To provide vocational-technical education programs for full-time and part-time students on campus during the day as well as the evening hours, and to provide appropriate programs for full-time and part-time students off campus in businesses and industries, comprehensive high schools and other locations within the respective schools' service areas.
8. To serve as a center for the delivery of postsecondary and adult vocational-technical education programs and services for the community and assigned service area.

STATEMENT OF LOCAL SYSTEM PHILOSOPHY, PURPOSE AND GOALS FOR VOCATIONAL EDUCATION

SECTION II

PURPOSE & OBJECTIVES

PURPOSE OF GUIDE

The purpose is defined in terms of the functional needs of each of the identified classes of users in the secondary and post secondary systems.

(a) Vocational teachers.

1. Provide a guide for organizing their program of instruction,
2. Assist in establishing program objectives,
3. Serve as a curriculum materials resource guide,
4. Improve communications with employers and advisory committees,
5. Facilitate competency based instruction,
6. Facilitate either group or self-paced instruction,
7. Include content by quarter and semester,
8. Cross-reference with existing state developed instructional materials (PLACE packages and post secondary I.I.).

(b) Vocational supervisors and administrators.

1. Assist in defining the scope and content of their programs,
2. Provide a means to improve curriculum management functions,
3. Serve as a guide for admissions and job placement functions,
4. Improve communications with employers and advisory committees.

(c) Counseling and guidance staff.

1. Provide a data base for counseling and guidance personnel,
2. Identify student exit points (Carrer Options),
3. Serve as guide for admissions and job placement,
4. Correlate with the new State Board of Education graduation requirements,
5. Provide specific content sequencing by quarter and semester for student scheduling,
6. Provide (a) curriculum options for the disadvantaged handicapped student, (b) curriculum modifications for SPECIAL NEEDS students, (c) typical admission requirements for regular and SPECIAL NEEDS students.

(d) Local Curriculum Coordination Committees.

1. Serve as a guide in working out articulation arrangements,
2. Improve definitions of the relationship between secondary clusters and post secondary specialized programs.

This guide will serve as an ideal communication device between school personnel and the craft advisory committee. By personally reviewing the guide with the local craft advisory committee the teacher will be able to maintain the accuracy of the guide in terms of the local job market and will also be able to inform representatives of local industry regarding the content of the program itself.

MASONRY PROGRAM OBJECTIVE

Given appropriate instruction, as suggested by this guide, a student completing the program should demonstrate entry level skills in Masonry in the areas of knowledge, theoretical structure, tool usage, diagnostic ability, related supportive skills and occupational survival skills.

As the student progresses through the program, sufficient competencies will be acquired to enable the student to enter the occupational field at the following curriculum exit points.

Bricklayer Helper	(D.O.T. Code 861.687-010)
Cement Mason	(D.O.T. Code 844.369-010)
Stone Mason	(D.O.T. Code 861.381-038)
Terazzo Worker	(D.O.T. Code 861.381-046)
Bricklayer, Construction	(D.O.T. Code 861.381-018)

SECTION III

D. O. T. DESCRIPTION, EXIT POINTS, TASKS

DESCRIPTION OF OCCUPATIONAL FIELD

The primary purpose of this section is to provide a general orientation to the occupational field. This orientation may be used by counseling and guidance staff in helping students to select subject areas. It may also be used by instructors for new students just entering the program area. The description delimits the scope of the occupational field in terms of the range of activities involved in a series of occupations. It contains information about career potential within the occupational field, including job market conditions and trends.

The description identifies prerequisite skills and knowledge for those students interested in entering the occupational field. In addition, the Description of Occupational Exit Points are provided to aide the instructor in identifying possible jobs for early leavers. A listing of employability skills is also included in this section.

DESCRIPTION OF OCCUPATION

Masonry*

Nature of the Work

From the construction field bricklayers and stonemasons work in closely related trades, each producing attractive, durable surfaces. Bricklayers build walls, partitions, fireplaces and other structures with brick, cinder block and other masonry materials. They also install brick linings in industrial furnaces.

Stonemasons build stone walls as well as set stone exteriors and floors. They work with two types of stone - natural cut and artificial.

In putting up a wall, bricklayers first build the corners at each end of the wall, using plumblines and a level. A line then is stretched from corner to corner as a guide for each course or layer of brick. Bricklayers spread a bed of mortar (cement mixture) with a trowel (a flat metal tool), place the brick on the mortar bed, and then tap it into place. As blueprints specify, they cut bricks with a hammer and chisel to fit around windows, doors and other openings. Mortar joints are finished with jointing tools to leave a neat and uniform appearance. Bricklayers also may use supports at window and door openings.

Stonemasons often work from a set of drawings in which each stone has been numbered for identification. Helpers may locate and bring the prenumbered stones to the masons. A derrick operator using a hoist may be needed to lift large pieces into place.

When building a stone wall, masons set the first layer of stones into a shallow bed of mortar. They align the stones with plumblines and levels, and tap them into position with a wood mallet. Masons build the wall by alternating layers of mortar and stone. As the work progresses, they fill the joints between stones with mortar using a pointed metal tool to smooth the mortar to an attractive finish. To hold stones in place, stonemasons sometimes position pieces of metal within the wall by welding or bolting them together. After positioning the rocks, they cover the metal with mortar. Finally, for a clean appearance, masons wash the stone with a mild acid solution to remove dirt and dry mortar.

Bricklayers, stonemasons and marble setters primarily use handtools-including trowels, brick and stone hammers, wooden or rubber mallets and chisels. For exacting cuts of brick, stone, or marble, they use high-powered electric saws equipped with special cutting blades.

Working Conditions

Bricklayers and stonemasons usually work outdoors. They stand, kneel, or stoop for long periods and may have to lift heavy materials to complete a job. They also are subject to injuries from tools and falls from scaffolds. Despite the physical demands and general hazards of construction, however, these workers are less likely to be injured than other construction workers.

Places of Employment

About 204,000 bricklayers, stonemasons and other types of masons were employed in 1978; most were bricklayers. Workers in these crafts were employed primarily by special trade, building, or general contractors. A relatively small number of bricklayers work for government agencies or businesses that do their own construction and alteration.

Workers in these trades are employed throughout the country, but are concentrated in metropolitan areas. In cities that are too small to have a demand for full-time stonemasons or marble setters, bricklayers will install stone or marble as a sideline.

About 1 out of 4 bricklayers, stonemasons, and marble setters is self-employed-a proportion higher than that in most building crafts. Many of the self-employed specialize in contracting on small jobs such as patios, walks, and fireplaces.

Training, Other Qualifications, and Advancement

High school vocational education courses provide a solid grounding which serves as a springboard into work situations which then provide on-the-job experience and growth. Additional training for these new employees can come in the form of apprenticeships which are described below.

Many bricklayers as well as some stonemasons and other masons pick up their skills informally by working as helpers or hod carriers and by observing and learning from experienced workers. The remainder learn their skills through apprenticeships.

Individuals who learn the trade informally become bricklayers. They start with carrying materials, moving scaffolds, and mixing mortar. However, it takes several months to a year before they are taught to spread mortar and lay brick. They begin with simple patterns and progress to more complex designs. Learning to set stone or marble might take several years.

Apprenticeships for bricklayers, stonemasons, and other masons usually are sponsored by local contractors or by local union-management committees. The apprenticeship program requires 3 years of on-the-job training, in addition to 144 hours of classroom instruction each year in subjects such as blueprint reading, mathematics, layout work, and sketching. Apprentices learn the general applications of brick, stone, and marble.

Apprentices start by carrying materials and mixing mortar. Within 2 or 3 months, they learn to work with stone and marble. After apprenticeship, they usually specialize in one of the three trades.

Applicants for apprenticeships must be at least 17 years old. Apprentice and helper applicants should be in good physical condition. A high school or vocational education is preferable, as are courses in mathematics, mechanical drawing, and shop.

Experienced workers can advance to supervisory positions or become estimators. They also can open contracting businesses of their own.

Employment Outlook

Employment of bricklayers is expected to grow more slowly than the average for all occupations through the 1980's. Although few job openings will result from growth in the demand for these workers, many openings will arise as experienced bricklayers retire, die, or leave the occupation for other reasons. Almost all new employees will be hired as bricklayers.

While population and business growth create a need for new homes, factories, offices, and other structures, the demand for bricklayers will grow. Stimulating this growth will be increasing use of brick for decorative work on building fronts and in lobbies and foyers. The use of brick, particularly for interior loadbearing walls and prefabricated brick panels, is growing and will add to overall employment needs. However, the substitution of cement or other less expensive materials for brick will moderate employment growth.

The number of job openings for bricklayers may fluctuate from year to year because employment in this trade is sensitive to ups and downs in construction activity. For any given year, however, opportunities are best during the spring and summer when construction activity picks up.

Sources of Additional Information

International Union of Bricklayers and Allied Craftsmen,
International Masonry Apprenticeship Trust, 815 15th
Street, N.W., Washington, D.C. 20005

Associated General Contractors of America, Inc. 1957 East
Street, N.W., Washington, D.C. 20006

Brick Institute of America, 1750 Old Meadow Road, McLean,
Virginia 22101

Associated Builders and Contractors, Inc., 444 North Capitol
Street, N.W., Suite 409, Washington, D.C. 20001

National Association of Home Builders, Manpower Development
and Training Department, 15th and M. Street, N.W., Washington,
D.C. 20005

EMPLOYABILITY SKILLS

In addition to the aptitudes, abilities, interests, physical requirements and job skills listed in the preceding Description of Occupation, employability skills exert a great deal of influence on a person's ability to get and keep a job. Surveys indicate that more people lose their jobs because of poor attitudes toward their job than for lack of job skills. For this reason it is important that information concerning the following employability skills be provided as an ongoing part of the program.

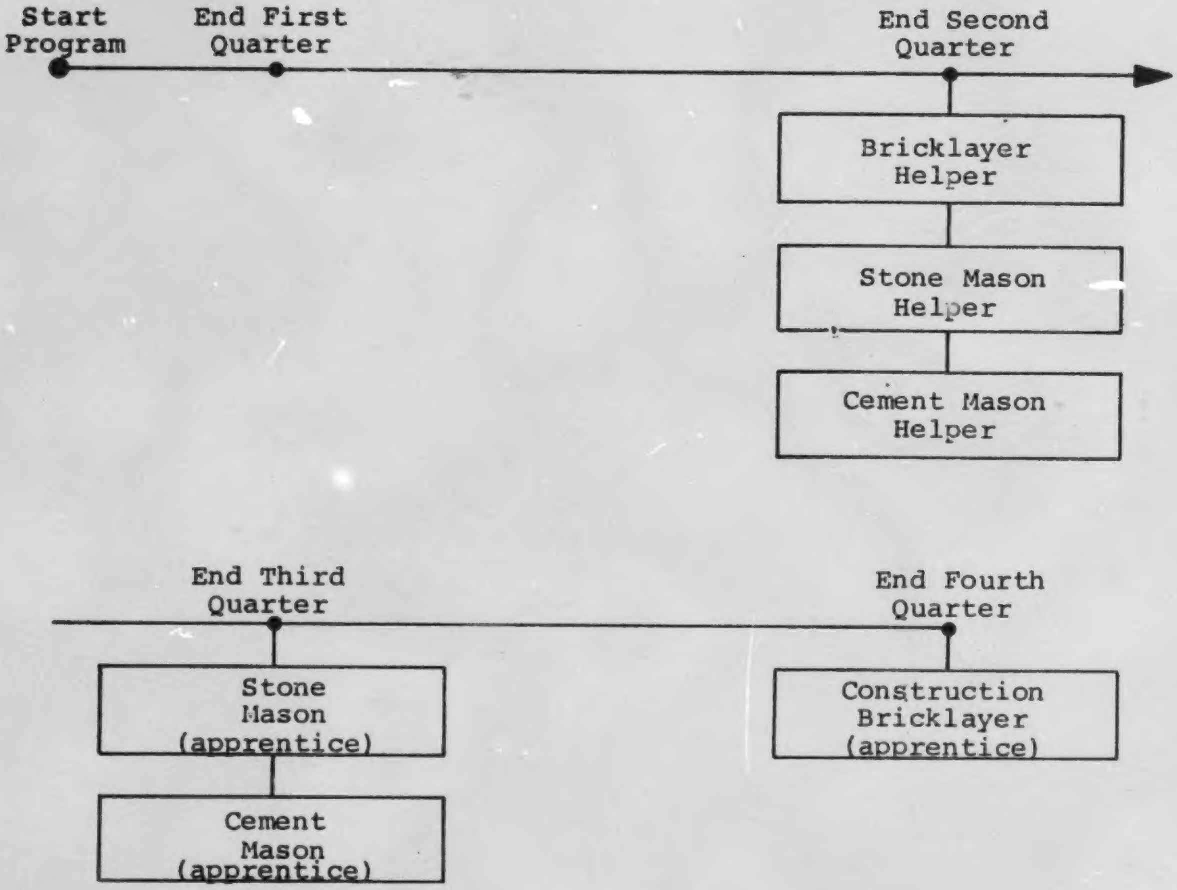
1. Getting a job
    a. Filling out job applications
    b. Developing a resume
    c. Preparing for a job interview

2. Keeping a job
    a. Be on time and regular in attendance
    b. Maintain a fair share of the work-load
    c. Work without supervision
    d. Meet production schedules
    e. Properly care for and use equipment
    f. Dress appropriately for the job
    g. Maintain good personal hygiene
    h. Develop and maintain good communication with supervisors and co-workers

EXIT POINTS

The diagram on the following page is based on the Suggested Course Outline Structure. It graphically illustrates the points in the Masonry program where the student should have acquired the competencies necessary for entry level employment into the job classification indicated. In many cases, by the time students reach an exit point they may have acquired several competencies in addition to those required for the specific job classification.

The course outline is structured to present in a classroom setting the job entry skills in masonry. Specific requirements of each of the masonry occupations are based on tasks performed by workers in the masonry field and held essential for initial employment. It is fully recognized in the structuring of this curriculum that primarily classroom and laboratory activities will be presented to the students with only a limited amount of live work available. In addition, the exit point listing recognizes that a student would enter an occupation as an apprentice and would need several years of experience prior to becoming a journeyman.


Start Program
End First Quarter
End Second Quarter
Bricklayer Helper
Stone Mason Helper
Cement Mason Helper
End Third Quarter
End Fourth Quarter
Stone Mason (apprentice)
Cement Mason (apprentice)
Construction Bricklayer (apprentice)

TASK LISTING BY D.O.T. CODE

The tasks are listed in this section in a matrix format that cross references them with the applicable D.O.T. codes for the exit point occupational titles. Each task is identified with one or more of the exit point occupational titles. This information may be used to make specific determination as to when a student has developed the necessary skills to qualify for an exit point. This information is particularly useful in preparing early leavers to meet the requirements for a specific occupational title.

TASK LISTING BY DOT CODE

MASONRY

		POSSIBLE EXIT POINTS					
	DOT DESCRIPTIONS	Cement Mason Helper	Bricklayer Helper	Stone Mason Helper	Cement Mason	Stone Mason	Bricklayer Construction
	DOT NO.	869.687-026	861.687-010	869.687-026	844.364-010	861.381-038	861.381.018
TASK NO.	TASK NAME						
01	Spreading Mortar	X	X	X	X	X	X
02	Laying Brick to a Line		X				X
03	Building a Brick Corner						X
04	Cutting Brick and Block		X	X		X	X
05	Determining Spacing for Standard Sized Brick						X
06	Laying Out Courses to Sill and Cornice Height						X
07	Interpreting and Using a Line Modular Rule		X	X		X	X
08	Dimensioning and Scaling a Working Drawing						X
09	Identifying Names and Uses of Lines and Symbols on a Working Drawing						X
10	Identifying Different Views and Their Uses on a Working Drawing						X
11	Setting Batter Boards	X	X		X		X
12	Inspecting Grading at Building Site				X	X	X
13	Finishing Grading at Building Site	X	X	X	X	X	X

TASK LISTING BY DOT CODE

MASONRY

		POSSIBLE EXIT POINTS					
	DOT DESCRIPTIONS	Cement Mason Helper	Bricklayer Helper	Stone Mason Helper	Cement Mason	Stone Mason	Bricklayer Construction
TASK NO.	**TASK NAME** / DOT NO.	869.687-026	861.687-010	869.687-026	844.364-010	861.381-038	861.381.018
14	Setting Frames for Footing/Foundations	X			X		X
15	Installing Steel Reinforcing	X	X	X	X	X	X
16	Operating a Transit				X		X
17	Pouring Footing	X			X		X
18	Laying an Eight Inch Wall with Header						X
19	Building an L-shaped Eight Inch Wall with Header Coursed, Header Caps and Rowlocks						X
20	Constructing Cavity Walls						X
21	Laying a Four Inch Block Corner in Running Bond						X
22	Laying an Eight Inch Block Corner in Running Bond						X
23	Building a Six Inch Block Corner in Running Bond						X
24	Building a Twelve Inch Block Corner in Running 1/2 Bond						X
25	Laying a Block Corner in Stacked Bond						X
26	Building an English Corner						X

TASK LISTING BY DOT CODE

MASONRY

POSSIBLE EXIT POINTS

TASK NO.	TASK NAME	DOT DESCRIPTIONS: Cement Mason Helper DOT NO.: 869.687-026	Bricklayer Helper 861.687-010	Stone Mason Helper 869.687-026	Cement Mason 844.364-010	Stone Mason 861.381-038	Bricklayer Construction 861.381.018
27	Building a Dutch Corner						X
28	Laying a Flemish Bond						X
29	Laying an English Bond						X
30	Making and Testing Concrete	X			X		X
31	Finishing Concrete	X			X		X
32	Estimating Concrete				X		X
33	Mixing and Finishing Terrazzo				X		X
34	Estimating Masonry Materials						X
35	Setting Corner Poles						X
36	Laying Reinforced Brick Masonry						X
37	Setting Lintels	X	X			X	X
38	Making Reinforced Lintels						X
39	Setting Door Frames						X
40	Using Anchors to Tie Doors to Walls						X
41	Setting Window Frames		X				X
42	Laying Soldier Courses						X
43	Laying Rowlock Sills						X
44	Placing Expansion Joints						X
45	Building Brick Steps						X

TASK LISTING BY DOT CODE

MASONRY

POSSIBLE EXIT POINTS

TASK NO.	TASK NAME	Cement Mason Helper	Bricklayer Helper	Stone Mason Helper	Cement Mason	Stone Mason	Bricklayer Construction
	DOT NO.	869.687-026	861.687-010	869.687-026	844.364-010	861.381-038	861.381.018
46	Constructing Glazed Fire Walls						X
47	Laying Structural Clay Tile						X
48	Waterproofing Walls	X	X		X		X
49	Setting Stone			X		X	X
50	Cleaning Brickwork		X				X
51	Building Rough Fireplace and Ash Pit						X
52	Setting Clean-Out Door						X
53	Forming Firebox						X
54	Setting Ash Dump						X
55	Assembling and Setting Damper						X
56	Forming Wind Shelf						X
57	Building Smoke Chamber						X
58	Setting and Cutting Flue Liners						X
59	Topping and Capping Chimney						X
60	Flashing Chimney						X
61	Facing Fireplace						X
62	Building Hearth						X
63	Building Single Flue Chimney						X
64	Building Bar-B-Que Pit						X

TASK LISTING BY DOT CODE

MASONRY

POSSIBLE EXIT POINTS

TASK NO.	TASK NAME	DOT DESCRIPTIONS: Cement Mason Helper DOT NO.: 869.687-026	Bricklayer Helper 861.687-010	Stone Mason Helper 869.687-026	Cement Mason 844.364-010	Stone Mason 861.381-038	Bricklayer Construction 861.381.018
65	Installing Heatilator						X
66	Building a Diamond Pattern Wall						X
67	Laying a Basket Weave Bond						X
68	Laying a Herringbone Weave Bond						X
69	Cutting and Laying Mitre Blocks						X
70	Building a Jack Arch						X
71	Building a Segmented Arch						X
72	Building a Soldier Arch						X
73	Laying Glass Blocks						X
74	Laying Walks and Floors						X
75	Building Planters						X
76	Building Garden Walls						X

SECTION IV

CURRICULUM STRUCTURE & COURSE OUTLINE

CURRICULUM STRUCTURE

The following three examples of curriculum structures are provided to illustrate different ways a Masonry curriculum may be structured. These examples are not intended to imply there are no other ways to structure the curriculum. All three alternatives are examples from various programs found in the post-secondary schools in Georgia.

The alternatives presented feature three different time frames for the total length of the Masonry program. Alternative 1 is a four quarter program designed to provide the basic classroom and laboratory experiences needed at job entry. Alternative 2 provides basically the same program as Alternative 1 plus a two quarter option dealing with ceramic tile, marble and terrazzo. Alternative 3 is a seven quarter structure which allows a longer time frame for delivery of basic job entry skills and includes a one quarter practicum for field experience in Masonry.

Each instructor is encouraged to structure their curriculum and make time estimates based on their experience, students' needs and the local facilities. Instructors should also be aware of exit point options which do not require completion of the entire program (i.e. cement mason helper, bricklayer helper, etc.).

MASONRY CURRICULUM STRUCTURE

Alternative 1

Course Number	Course	Clock Hours
	First Quarter	
	Human Relations	26
	Consumer Relations	26
	Reading Construction Drawings	52
	Introduction to Bricklaying	104
	Bricklaying I	104
		312
	Second Quarter	
	Bricklaying II	104
	Advanced Masonry Projects I	104
	Advanced Masonry Projects II	104
		312
	Third Quarter	
	Welding for Bricklayers	52
	Estimating and Reading Construction Drawings	52
	Bricklaying III-Brick Construction	104
	Bricklaying IV-Block Construction	104
		312
	Fourth Quarter	
	Bricklaying V-Retaining Walls	104
	Bricklaying VI-Foundations	52
	Bricklaying VII-Residential Construction	104
	Waterproofing and Brick Cleaning	52
		312

MASONRY CURRICULUM STRUCTURE

Alternative 2

Course Number	Course	Clock Hours
	First Quarter	
	Basic Fundamentals in Masonry	52
	Basic Corners and Bonds	104
	Basic Brick Structural Bonds and Finishes	84
	Basic Block Structural Bonds and Finishes	72
		312
	Second Quarter	
	Basic Masonry Pattern Bonds	104
	Arches, Ornamental Bonds and Cleaning	52
	Blueprints, Specifications and Procedures	72
	Estimating and Motion Study	84
		312
	Third Quarter	
	Layout and Footing	52
	Foundation Walls	104
	Chimneys and Flues	52
	Conventional and Modified Fireplaces	104
		312
	Fourth Quarter	
	Masonry Floors	104
	Masonry Wall Construction	104
	Residential Construction	52

Course Number	Course	Clock Hours
	Commercial Construction	52
		312
		1248
	CERAMIC TILE, MARBLE AND TERRAZZO OPTION:	
	Fifth Quarter	
	Tools, Materials and Basic Fundamentals	52
	Preparation of Base	104
	Mortar Mixes and Their Application (Wall and Floor Work)	104
	Cutting, Fitting Tile and Marble Threshold	52
		312
	Sixth Quarter	
	Setting Tile and Accessories to Wall	104
	Pouring Terrazzo	104
	Grouting, Cleaning and Curing Finished Floors	52
	Grinding, Polishing and Sealing Terrazzo	52
		312

MASONRY CURRICULUM STRUCTURE

Alternative 3

Course Number	Course	Clock Hours
	First Quarter	
	Introduction to Masonry and General Construction Safety	52
	Basic Materials Handling and Mixing	52
	Mortar and Joints	52
	Blueprint Reading	104
	Applied Mathematics	52
		312
	Second Quarter	
	Lay-out	52
	Construction Foundations	52
	Laying Cement Block	104
	Forming and Pouring	52
	Special Projects in Concrete	52
		312
	Third Quarter	
	Consumer Education	52
	Basic Terrazzo	104
	Laying Glazed Wall Tile	52
	Stone Masonry	104
		312
	Fourth Quarter	
	Basic Brick Veneering	52
	Ceramic Tile Setting	52
	Bonds	104

Course Number	Course	Clock Hours
	Alterations and Repairs	104
		312
	Fifth Quarter	
	Constructing Walls	208
	Building Pilasters	52
	Building Brick Piers	52
		312
	Sixth Quarter	
	Setting Clay Tile and Stone	104
	Constructing Steps	52
	Chimneys, Flues and Fireplaces	104
	Building Outdoor Structures	52
		312
	Seventh Quarter	
	Practicum	312

COURSE OUTLINE

The sample course outline is to be used as an example to facilitate the development of alternative outlines for the individual learner. However, the listing of the tasks within a quarter is not meant to indicate a required sequence or pattern. Many of the tasks are independent of each other therefore allowing a student or groups of students to begin the quarter at different points. This allows better coordination of the laboratory hours, and the learning objectives may be selected according to the type of clinical practice available. The specific information required to teach the skills and related theory for each unit/task is included on the corresponding unit sheet in the Unit Guide section.

The time estimations are a minimum amount of time required and should be extended according to the learner's individual needs. The laboratory hours may be rearranged according to the needs of the learners and to any constraints imposed due to live work policies.

Exit points have been identified and are listed in chart form (refer to the table of contents). In addition the exit points are identified in the Task Listing by D.O.T. code. This will provide a means for employment for learners who master the skills but not the theory. A competency record of all the tasks the learner can perform safely may be given to the prospective employers. These exit points can help improve attrition problems for schools and should prevent a feeling of failure for learners who do not complete the entire program.

Suggested Course Outline Structure for Masonry

Quarter I

Unit/Task	Title	Classroom Hours
	Competency: Performing Basic Bricklaying Manipulations	
M-01	Spreading Mortar	2
M-02	Laying Brick to a Line	2
M-03	Building a Brick Corner	3
M-04	Cutting Brick and Block	1
	Competency: Using a Brick Spacing Rule	
M-05	Determining Spacing for Standard Sized Brick	4
M-06	Laying Out Courses to Sill and Cornice Height	2
M-07	Interpreting and Using a Line Modular Rule	1
	Competency: Using Working Drawings	
M-08	Dimensioning and Scaling a Working Drawing	4
M-09	Identifying Names and Uses of Lines and Symbols on a Working Drawing	2
M-10	Identifying Different Views and Their Uses on a Working Drawing	2
	Competency: Preparing Footings and Foundations	
M-11	Setting Batter Boards	3
M-12	Inspecting Grading at Building Site	2
M-13	Finishing Grading at Building Site	2
M-14	Setting Frames for Footing/Foundations	2
M-15	Installing Steel Reinforcing	1
M-16	Operating a Transit	2
M-17	Pouring Footing	1
	Quarter I Classroom Hours:	36
	Quarter I Laboratory Hours:	276
	Total Quarter Hours:	312

Quarter II

Unit/Task	Title	Classroom Hours
	Competency: Building Double Brick Walls	
M-18	Laying an Eight Inch Wall with Header	1
M-19	Building an L-Shaped Eight Inch Wall with Header Coursed, Header Caps and Rowlocks	1
M-20	Constructing Cavity Walls	2
	Competency: Building Block Corner	
M-21	Laying a Four Inch Block Corner in Running Bond	2
M-22	Laying an Eight Inch Block Corner in Running Bond	1
M-23	Building a Six Inch Block Corner in Running Bond	1
M-24	Building a Twelve Inch Block Corner in Running 1/2 Bond	2
M-25	Laying a Block Corner in Stacked Bond	1
	Competency: Laying Brick Bonds	
M-26	Building an English Corner	4
M-27	Building a Dutch Corner	2
M-28	Laying a Flemish Bond	2
M-29	Laying an English Bond	2
	Competency: Laying Concrete Slabs	
M-30	Making and Testing Concrete	6
M-31	Finishing Concrete	6
M-32	Estimating Concrete	10
	Competency: Mixing and Finishing Terrazzo	
M-33	Mixing and Finishing Terrazzo	8
	Competency: Estimating Masonry Materials	
M-34	Estimating Masonry Materials	10

Quarter II Classroom Hours: 61
Quarter II Laboratory Hours: 251

Total Quarter Hours: 312

Quarter III

Unit/Task	Title	Classroom Hours
	Competency: Constructing Buildings	
M-35	Setting Corner Poles	2
M-36	Laying Reinforced Brick Masonry	2
M-37	Making Reinforced Lintels	1
M-38	Setting Lintels	1
M-39	Setting Door Frames	1
M-40	Using Anchors to Tie Doors to Walls	1
M-41	Setting Window Frames	1
M-42	Laying Soldier Courses	1
M-43	Laying Rowlock Sills	1
M-44	Placing Expansion Joints	2
M-45	Building Brick Steps	1
M-46	Constructing Glazed Tile Walls	2
M-47	Laying Structural Clay Tile	2
M-48	Waterproofing Walls	2
M-49	Setting Stone	2
M-50	Cleaning Brickwork	3
	Competency: Constructing Chimneys and Fireplaces	
M-51	Building Rough Fireplace and Ash Pit	1
M-52	Setting Clean-Out Door	1
M-53	Forming Firebox	3
M-54	Setting Ash Dump	1
M-55	Assembling and Setting Damper	1
M-56	Forming Wind Shelf	1
M-57	Building Smoke Chamber	2
M-58	Setting and Cutting Flue Liners	1
	Quarter III Classroom Hours:	36
	Quarter III Laboratory Hours:	276
	Total Quarter Hours:	312

Quarter IV

	Title	
	Competency: Constructing Chimneys and Fireplaces	
M-59	Topping and Capping Chimney	2
M-60	Flashing Chimney	1
M-61	Facing Fireplace	2
M-62	Building Hearth	3
M-63	Building Single Flue Chimney	2

Unit/Task		Classroom Hours
M-64	Building Bar-B-Que Pit	1
M-65	Installing Heatilator	2
	Competency: Laying Brick for Ornamental Purposes	
M-66	Building a Diamond Pattern Wall	1
M-67	Laying a Basket Weave Bond	1
M-68	Laying a Herringbone Weave Bond	1
M-69	Cutting and Laying Mitre Blocks	1
M-70	Building a Jack Arch	1
M-71	Building a Segmental Arch	1
M-72	Building a Soldier Arch	1
M-73	Laying Glass Blocks	2
M-74	Laying Walks and Floors	2
M-75	Building Planters	2
M-76	Building Garden Walls	1

Quarter IV Classroom Hours:	27
Quarter IV Laboratory Hours:	285
Total Quarter Hours:	312

SECTION V

UNIT GUIDES

UNIT GUIDES

Description

In this section the tasks to be taught in each course are presented in sequential order. Each task is listed on a separate page so that it may be taken out of the guide for daily lesson planning or regrouped with other tasks to fit the individual teacher's own preference for teaching order. The task pages may be used for planning and executing group instruction or for individualized instruction. Each page in the UNIT GUIDES section contains the following information:

TASK: This is a short and concise statement of the task to be taught.

PERFORMANCE OBJECTIVE: The performance expected of the student after completing the unit is stated in stem form, without a specific statement of all conditions, equipment, and performance standard (these are listed in a criterion referenced measure in the Evaluation section of the task page).

INSTRUCTIONAL ACTIVITIES: Suggested learning activities are presented. These activities include providing information, demonstration, use of audio-visuals, and practical applications.

INSTRUCTIONAL MATERIALS: The materials that are necessary to carry out the instructional activities are listed. These include instructional units, textbooks, audio-visuals and equipment.

EVALUATION: This section contains a criterion referenced measure (where appropriate) and reference to any test items or other evaluation measures that are available to the teacher. The criterion referenced measure contains three parts--Condition, Performance and Standard.

CLASSROOM HOURS: The estimated time for completion of the instructional activities and the evaluation are indicated. This time estimate is stated in hours of classroom time (lectures, presentations, demonstrations, etc.). Additional time will be required for hands-on experience in the laboratory. Estimates for this time can be found in the Course Structure and Course Outline section.

TASK

M-01 Spreading mortar

PERFORMANCE OBJECTIVE

Demonstrate manipulations of the trowel.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Mix mortar
b. Identify and use trowel
c. Wet mortar board
d. Place mortar on board
e. Load trowel
f. Distribute mortar
g. Furrow mortar
h. Seal mortar to trowel

Provide Demonstration On:

a. Mixing mortar
b. Spreading mortar

Provide Practical Application On:

a. Mixing mortar
b. Spreading mortar

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dezettel
b. Kreh
c. Putnam

A/Vs:

Georgia, slide set BSB-1

Student Manuals:

Georgia, Unit BSB-1

Tools and Equipment:

a. Mortar board
b. Trowel

CLASSROOM HOURS 2

EVALUATION (M-01)

Given appropriate tools, equipment and supplies, the student will mix mortar to correct consistency and butter a 24" 2 X 4 on all sides in 12 seconds or less.

TASK

M-02 Laying brick to a line

PERFORMANCE OBJECTIVE

Lay brick plumb, level and to the line with uniform joints.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Lay out project
b. Identify and use masonry rules
c. Identify and use line pin
d. Identify and use line blocks
e. Identify and use level horizontally and vertically
f. Set line blocks and line
g. Set twig
h. Prepare head joints
i. Place bricks without touching line
j. Cut excess mortar

Provide Demonstration On:

a. Setting up to lay brick to a line
b. Laying brick to a line

Provide Practical Application On:

Setting up for and laying brick to a line

INSTRUCTIONAL MATERIALS

Textbooks:

a. Cook and Trent
b. Dezettel

A/Vs:

Georgia, slide set BSB-2

Student Manuals:

a. Georgia, Unit BSB-2
b. Kreh, Unit 15

Tools and Equipment:

a. Mortar board
b. Trowel
c. Line and line blocks
d. Level

CLASSROOM HOURS

2

EVALUATION (M-02)

Given adequate supplies and materials, the student will be able to lay bricks to the line. Bricks must be laid square, straight, plumb and within those guide lines of the VICA U.S. Skill Olympics Bricklaying Judge Sheet.

TASK

M-03 Building a brick corner

PERFORMANCE OBJECTIVE

Build a brick corner which is plumb and level.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Identify and use framing square
b. Mark the square line on floor
c. Drybonding
d. Position materials
e. Temper mortar
f. Lay initial course
g. Tuck pointing
h. Joint corner
i. Check for plumb and square
j. Check for correct height

Provide Demonstration On:

a. Setting up to build a brick corner
b. Building the brick corner

Provide Practical Application On:

Setting up for and building a brick corner

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dezettel
b. Putnam

A/Vs:

Georgia, slide set BSB-3

Student Manuals:

a. Georgia, Unit BSB-3
b. Kreh, Unit 16

Tools and Equipment:

a. Mortar board
b. Framing square
c. Trowel
d. Level

CLASSROOM HOURS 3

EVALUATION (M-03)

Given adequate tools and materials, the student will be able to rack back 45 brick corner using the VICA U.S. Skill Olympics Bricklaying Judge Sheet. Carefully check corner for:

1. Plumb
2. Square
3. Level
4. Correct height

TASK

M-04 Cutting brick and block

PERFORMANCE OBJECTIVE

Cut brick and block by various methods.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Identify and use brick hammer
b. Identify and use brick set
c. Identify and use masonry saw (portable and fixed)

Provide Demonstration On:

Cutting a quarter closure, queen closure, half closure, (bat), three quarter closure and trimming the cut

Provide Practical Application On:

Cutting brick and block in the various methods

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dezettel
b. Kreh
c. Putnam

A/Vs:

Georgia, slide set BSB-4

Student Manuals:

Georgia, Unit BSB-4

Tools and Equipment:

a. Brick hammer
b. Brick set

CLASSROOM HOURS

1

EVALUATION (M-04)

Given adequate tools and materials, the student will demonstrate an ability to cut brick and block using:

1. Brick hammer
2. Trowel
3. Brick set
4. Masonry saw (portable and fixed)

Bricks will be cut according to specifications designated by the instructor.

TASK

M-05 Determining spacing for standard sized brick

PERFORMANCE OBJECTIVE

Demonstrate knowledge of spacing requirements.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Identify brick spacing rule
b. Explain purpose of brick spacing rules and spacing
c. Identify essential spacings by course number
d. Read spacing rule
e. Use rule to estimate number of courses needed

Provide Demonstration On:

Reading and using a brick spacing rule

Provide Practical Application On:

Reading and using a brick spacing rule

INSTRUCTIONAL MATERIALS

Textbooks:

Putnam

A/Vs:

Georgia, slide set BSR-1

Student Manuals:

Georgia, Unit BSR-1

Tools and Equipment:

Spacing rule

CLASSROOM HOURS

4

EVALUATION (M-05)

Given adequate tools and materials, the student will demonstrate an ability to:

1. Read the spacing rule
2. Read the modular rule (block)
3. Determine number of courses

The work will be evaluated using the VICA U.S. Skill Olympics Bricklaying Judge Sheet.

TASK

M-06 Laying out courses to sill and cornice height

PERFORMANCE OBJECTIVE

Layout coursing to sill or cornice height, plumb and level.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Locate and identify sill
b. Locate and identify cornice
c. Layout to sill using brick spacing rule
d. Layout to cornice from sill using brick spacing rule

Provide Demonstration On:

a. Locating and identifying sill and cornice
b. Laying courses to sill or cornice

Provide Practical Application On:

Laying courses to sill or cornice

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dezzettel
b. Putnam

Student Manuals:

Georgia, Unit BSR-2

Tools and Equipment:

a. Mortar board
b. Trowel
c. Modular and spacing rules
d. Level

CLASSROOM HOURS 2

EVALUATION (M-06)

Given adequate tools and materials, the student will demonstrate an ability to layout sill and cornice by:

1. Figuring correct number of courses
2. Using the spacing rule
3. Laying to correct specifications window openings with brick and block

The work will be evaluated using the VICA U.S. Skill Olympics Bricklaying Judge Sheets.

TASK

M-07 Interpreting and using a line modular rule

PERFORMANCE OBJECTIVE

Lay brick to proper height and level with use of rules.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Identify modular rule
b. Explain purpose of modular rule
c. Read and use modular rule
d. How to layout for standard brick, concrete block, red tile and Roman brick

Provide Demonstration On:

Proper use of the modular rule

Provide Practical Application On:

Interpreting and using the modular rule

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dezettel
b. Kreh

A/Vs:

Georgia, slide set BSR-3

Student Manuals:

Georgia, Unit BSR-3

Tools and Equipment:

Modular rule

CLASSROOM HOURS 1

EVALUATION (M-07)

Given adequate tools and materials, the student will demonstrate an ability to lay course work accurately by using a modular rule. Resulting work must be level, plumb and the correct height.

TASK

M-08 Dimensioning and scaling a working drawing

PERFORMANCE OBJECTIVE

Dimension and scale a working drawing.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Dimension lines
b. Reading dimensions
c. Scaling lines on blueprint using architect's scale
d. Scaling lines on blueprint using 6' folding rule
e. Reading dimensions as noted on blueprint

Provide Demonstration On:

a. Use of architect's scale
b. Use of 6' folding rule to read dimensions

Provide Practical Application On:

Have student measure dimensions using architect's scale and 6' rule.

INSTRUCTIONAL MATERIALS

Textbooks:

B. I. A.

Tools and Equipment:

a. Working drawing
b. Architect's scale
c. 6' folding rule

CLASSROOM HOURS 4

EVALUATION (M-08)

a. Given a blueprint, architect's scale and a 6' folding rule, the student will take dimensions from a blueprint. The reading must be exact.

b. B. I. A., Plan Reading for Brickmasons

c. B. I. A., Blueprint Reading and Sketching Basic Course

TASK

M-09 Identifying names and uses of lines and symbols on a working drawing

PERFORMANCE OBJECTIVE

Identify the names and uses of lines and symbols on a working drawing.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. How different lines are drawn and their uses
b. Identifying different lines as used on blueprint
c. Knowing the use of each line
d. Identifying symbols on blueprint

Provide Practical Application On:

Have a student identify different lines on a working drawing and explain their uses.

INSTRUCTIONAL MATERIALS

Textbooks:

B. I. A.

CLASSROOM HOURS 2

EVALUATION (M-09)

a. Given a blueprint, the student will identify the use of the different lines found on it. The student must also identify the symbols for different construction materials.

b. B. I. A., Plan Reading for Brickmasons

c. B. I. A., Blueprint Reading and Sketching Basic Course

TASK

M-10 Identifying different views on a working drawing and their uses

PERFORMANCE OBJECTIVE

On a working drawing, identify different views and their uses.

INSTRUCTIONAL ACTIVITIES

Provide Information On:	Provide Practical Application On:
a. Different views and their uses b. Identify plan view c. Identify elevation view d. Identify section view e. Identify detail drawing	Have student identify and explain the use of different views.

INSTRUCTIONAL MATERIALS

Textbooks:

B. I. A.

CLASSROOM HOURS 2

EVALUATION (M-10)

a. Given a blueprint, the student will recognize what portion of the structure each view represents.

b. B. I. A., Plan Reading for Brickmasons

c. B. I. A., Blueprint Reading and Sketching Basic Course

TASK

M-11 Setting batter boards

PERFORMANCE OBJECTIVE

Layout and set batter board.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. 6, 8, 10 method
b. Use of transit
c. Locating building site
d. Layout drive stakes for batter board
e. Marking foundation height at corners using transit
f. Nailing top of batter boards at these points
g. Keeping batter boards level
h. Squaring corners
i. Attaching lines

Provide Demonstration On:

a. Layout by 6, 8, 10 method
b. Layout using transit

Provide Practical Application On:

Have student lay out and set batter boards using one of the two methods.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dalzell and Townsend
b. B. I. A.

A/Vs:

B. I. A., "Laying Out A Foundation"

Student Manuals:

B. I. A., Project 34

Tools and Equipment:

a. Batter boards
b. Transit
c. 100' tape

CLASSROOM HOURS

3

EVALUATION (M-11)

a. Given batter boards, transit and 100' steel tape, the student will layout and set batter boards for a building. The student will check work by using 6, 8, 10 method. Batter boards will be set level and building lines must be square.

b. B. I. A., Bricklaying Vocational Training

c. B. I. A., Bricklaying III

TASK

M-12 Inspecting grading at building site

PERFORMANCE OBJECTIVE

Inspect type of soil to determine type and size of footing.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Types of soil
b. Bearing capacity of soil
c. Type and sizes of footings
d. Actions of weather on footings
e. Recognizing different types of soil
f. Recognizing which soil is best through the poorest for bearing capacity
g. Identifying best type of footing for each soil
h. Determining the effects of freezing on footings

Provide Practical Application On:

Have student explain types of soil and what to do on poor bearing soil.

INSTRUCTIONAL MATERIALS

Textbooks:

a. B. I. A.
b. Dalzell and Townsend

CLASSROOM HOURS 2

EVALUATION (M-12)

a. Given various on-site samples, the student will identify the different types and bearing loads of soil. The student will also identify what types and sizes of footing to put in different soils.

b. B. I. A., Bricklaying I

TASK

M-13 Finishing grading at building site

PERFORMANCE OBJECTIVE

Grade to proper depth and fine grade for proper footings.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Shapes of footings
b. Types of soil
c. Foundation blueprints
d. Purpose of footings
e. Determining depth of grade from specifications
f. Excavating
g. Keeping sides straight and bottom level

Provide Practical Application On:

Have student determine, from blueprint, the proper grading depth.

INSTRUCTIONAL MATERIALS

Textbooks:

a. B. I. A.
b. Dalzell and Townsend

Tools and Equipment:

a. Blueprint
b. 6' folding rule

CLASSROOM HOURS 2

EVALUATION (M-13)

a. Given a blueprint, the student will be able to determine the proper depth and proper type of footing. The student will grade the sides and bottom according to blueprint specifications.

b. B. I. A., Bricklaying I

TASK

M-14 Setting frames for footing and foundations

PERFORMANCE OBJECTIVE

Set forms for concrete.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Types of forms
b. Requirements of forms

Provide Practical Application On:

Have student set form for footing.

Provide Demonstration On:

a. Placing forms
b. Bracing forms

INSTRUCTIONAL MATERIALS

Textbooks:

Dalzell and Townsend

Tools and Equipment:

a. Proper lumber
b. Saw
c. Hammer
d. Nails

CLASSROOM HOURS 2

EVALUATION (M-14)

Given proper tools and materials, the student will set a form for concrete footings. The form must be straight, square and rigidly braced.

TASK

M-15 Installing steel reinforcing

PERFORMANCE OBJECTIVE

Layout and install reinforcing rods.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Kinds of rods
b. Sizes of rods
c. Methods of installing rods

Provide Demonstration On:

a. Tying rods
b. Placing rods

Provide Practical Application On:

Have student place and tie rods.

INSTRUCTIONAL MATERIALS

Textbooks:

Dalzell and Townsend

Tools and Equipment:

a. Reinforcing rods
b. Tie wire
c. Side cutting pliers

CLASSROOM HOURS 1

EVALUATION (M-15)

Given steel reinforcing rods and proper tools, the student will place and tie reinforcing rods according to manufacturer's specifications.

TASK

M-16 Operating a transit

PERFORMANCE OBJECTIVE

Set up and use a transit.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Care of transit
b. Uses of transit
c. How to set up transit
d. How to operate transit
e. Leveling and squaring with a transit

Provide Demonstration On:

a. Set up of transit
b. Operating transit

Provide Practical Application On:

Have student set up a transit and use it to level and square.

INSTRUCTIONAL MATERIALS

Textbooks:

B. I. A.

Tools and Equipment:

a. Transit
b. Tripod
c. Surveyor's rod
d. 6' Folding rule

CLASSROOM HOURS

2

EVALUATION (M-16)

Given transit, surveyor's rod or 6' folding rule, the student will set up a transit. The student will level and square a foundation.

TASK

M-17 Pouring footing

PERFORMANCE OBJECTIVE

Grade stakes and pour concrete footings.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Finding correct height
b. Properties of concrete

Provide Demonstration On:

a. Setting grade stakes
b. Pouring and smoothing concrete

Provide Practical Application On:

Have student set stakes and pour concrete.

INSTRUCTIONAL MATERIALS

Textbooks:

a. B. I. A.
b. Dalzell and Townsend

Tools and Equipment:

a. Shovel
b. Rake
c. Float
d. Grade stakes
e. Concrete

CLASSROOM HOURS 1

EVALUATION (M-17)

a. Given prepared ditches and proper tools, the student will set grade stakes for a given height and pour concrete to the top of the grade stakes.

b. Performance Guide, V'TECS, p. 19

TASK

M-18 Laying an 8" wall with header

PERFORMANCE OBJECTIVE

Lay an 8" wall with header.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Layout for the initial course
b. Procedure for building
c. Lay initial course
d. Plumb and level initial course
e. Lay proceeding courses
f. Construct corner leads
g. Lay header course

Provide Demonstration On:

a. Laying out the double brick wall
b. Constructing corner leads
c. Laying the wall

Provide Practical Application On:

Laying out and constructing an 8" brick wall with header

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dezettel
b. Putnam

A/Vs:

Georgia, slide set DBW-1

Student Manuals:

a. Georgia, Unit DBW-1
b. Kreh, Unit 15
c. B.I.A., Projects 2, 3 and 6

Tools and Equipment:

a. Mortar board
b. Trowel
c. Level
d. Spacing rule

CLASSROOM HOURS 1

EVALUATION (M-18)

Given adequate tools and materials, the student will demonstrate an ability to dry bond initial course, interpret drawing on proceeding courses, lay courses to proper height indicated on plan and run rowlock cap on wall. All work will be evaluated using the VICA U.S. Skill Olympics Bricklaying Evaluation Sheet.

TASK

M-19 Building an L-shaped 8" wall with header courses, header caps and rowlocks

PERFORMANCE OBJECTIVE

Build an 8", L-shaped wall.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Methods of positioning brick and laying out the initial course
b. Plumbing and leveling the initial course
c. Lay proceeding courses
d. Plumbing and leveling proceeding courses
e. Procedure for laying rowlock caps, header caps and header courses
f. Strike joints and clean wall

Provide Demonstration On:

a. How to position brick for an 8" wall
b. How to lay 8" corners and walls with header courses, header caps and rowlocks

Provide Practical Application On:

Laying 8" corners and walls with header courses, header caps and rowlocks

INSTRUCTIONAL MATERIALS

Textbooks:

Dezettel

A/Vs:

Georgia, slide set DBW-1

Student Manuals:

a. Kreh, Unit 22
b. Georgia, Units DBW-2, DBW-3 and DBW-4

Tools and Equipment:

a. Mortar board
b. Framing square
c. Trowel
d. Level

CLASSROOM HOURS 1

EVALUATION (M-19)

Given adequate tools, materials and plans, the student will build an eight inch L-shaped wall with header courses, header caps and rowlocks. The resulting work will be straight, level and plumb. The overall work will be judged using the VICA U.S. Skill Olympics Bricklaying Evaluation Sheet.

TASK

M-20 Constructing cavity walls

PERFORMANCE OBJECTIVE

Construct cavity walls.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

- a. Uses of cavity walls
- b. Purpose of flashing and weep holes
- c. Flashing
- d. Through wall bonding
- e. Metal ties

Provide Demonstration On:

- a. Installing flashing
- b. Layout of cavity wall
- c. Making weep holes

Provide Practical Application On:

Have student build cavity

INSTRUCTIONAL MATERIALS

Textbooks:

- a. B.I.A.
- b. Dalzell and Townsend

Student Manuals:

B.I.A., Project 7

Tools and Equipment:

- a. Mason tool bag
- b. Flashing material
- c. Brick and mortar

CLASSROOM HOURS

2

EVALUATION (M-20)

a. Given tools and materials, the student will construct cavity walls that are level and straight. Flashing must be installed to drain water toward the outside wall and weep holes must be kept clear of mortar.

b. Performance Guide, V'TECS, p. 32

TASK

M-21 Laying a 4" block corner in running board

PERFORMANCE OBJECTIVE

Lay a block corner in running board.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Identify a 4" block
b. Explaining purposes of 4" block
c. Lay out initial course
d. Laying and plumbing initial course
e. Level initial course
f. Lay plumb and level each proceeding course

Provide Demonstration On:

a. Setting up to build a 4" block corner
b. Building a 4" block corner

Provide Practical Application On:

Setting up for and building a 4" block corner

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dezettel
b. Kreh
c. Putnam

A/Vs:

a. Georgia, slide set CD-1
b. Georgia, slide set CBC-1
c. Georgia, slide set CBC-2

Student Manuals:

Georgia, Unit CBC-2

Tools and Equipment:

a. Trowel
b. Mortar board
c. Framing square
d. Level

CLASSROOM HOURS 2

EVALUATION (M-21)

a. Given adequate tools and materials, the student will lay a 4" block corner in running bond which is plumb, level and square.

b. Bricklaying Rating Sheet, VICA U.S. Skills Olympics Regulations, VICA, p. 67

TASK

M-22 Laying an 8" block corner in running bond

PERFORMANCE OBJECTIVE

Lay a block corner with 8" block.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Identify an 8" block
b. Identify and explain purpose of multi-purpose block
c. Identify and explain purpose of stretcher block
d. Lay out initial course
e. Lay, plumb and level initial course
f. Laying proceeding courses

Provide Demonstration On:

Setting up to build
1. Block corner
2. Building the block corner

Provide Practical Application On:

Setting up for and building a brick corner

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dezettel
b. Kreh
c. Putnam

A/Vs:

a. Georgia, slide set CD-1
b. Georgia, slide set CBC-1
c. Georgia, slide set CBC-2

Student Manauls:

Georgia, Unit CBC-1

Tools and Equipment:

a. Trowel
b. Mortar board
c. Framing square
d. Level

CLASSROOM HOURS 1

EVALUATION (M-22)

a. Given adequate tools and materials, the student will lay an 8" block corner in running bond which is plumb, level and square.

b. Bricklaying Rating Sheet, VICA U.S. Skills Olympics Regulations, VICA, p.67

TASK

M-23 Building a 6" block corner in running bond

PERFORMANCE OBJECTIVE

Lay a block corner with 6" block.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Identify a 6" block
b. Explain purpose of 6" block
c. Layout initial course
d. Drybond initial course
e. Lay initial course
f. Plumb and level initial course
g. Lay, plumb and level each proceeding course
h. Cleaning corner

Provide Demonstration On:

a. Setting up to build a 6" block corner
b. Building the block corner

Provide Practical Application On:

Setting up for and building a 6" block corner

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dezettel
b. Kreh
c. Putnam

A/Vs:

a. Georgia, slide set CD-1
b. Georgia, slide set CBC-1
c. Georgia, slide set CBC-2

Student Manuals:

Georgia, Unit CBC-3

Tools and Equipment:

a. Trowel
b. Mortar board
c. Framing square
d. Level

CLASSROOM HOURS

1

EVALUATION (M-23)

a. Given adequate tools and materials, the student will lay a 6" block in running bond which is plumb, level and square. (Note: Elbow or "L" blocks are required to course out properly on 6" corners).

b. Bricklaying Rating Sheet, VICA U.S. Skills Olympics Regulations, VICA, p. 67

TASK

M-24 Building a 12" block corner in running 1/2 bond

PERFORMANCE OBJECTIVE

Lay a block corner with 12" block in 1/2 running bond.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Identify 12" block
b. Explain purpose of 12" block
c. Layout initial course
d. How to drybond and lay the courses

Provide Demonstration On:

a. Setting up to build a 12" block corner in 1/2 bond
b. Building a 12" block corner in 1/2 bond

Provide Practical Application On:

Setting up for and building a 12" block corner in 1/2 bond

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dezettel
b. Kreh
c. Putnam

A/Vs:

a. Georgia, slide set CD-1
b. Georgia, slide set CBC-1
c. Georgia, slide set CBC-2

Student Manuals:

Georgia, Unit CBC-4

Tools and Equipment:

a. Mortar Board
b. Framing square
c. Trowel
d. Level

CLASSROOM HOURS

2

EVALUATION (M-24)

a. Given adequate tools and materials, the student will lay a 12" block corner in running bond which is plumb, level and squre.

b. Bricklaying Rating Sheet, VICA U.S. Skills Olympics Regulations, VICA, p. 67

TASK

M-25 Lay a block corner in stacked bond

PERFORMANCE OBJECTIVE

Lay a block corner out of 8" block.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Identify and explain purpose of stacked bond
b. Layout initial course
c. Mounting and hanging line
d. Lay initial course
e. Plumbing and leveling initial course
f. Lay proceeding courses
g. Plumb and level proceeding courses

Provide Demonstration On:

a. Setting up to build a block corner in stacked bond
b. Building the 8" block corner

Provide Practical Application On:

Setting up for and building a 8" block corner

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dezettel
b. Kreh
c. Putnam

A/Vs:

a. Georgia, slide set CD-1
b. Georgia, slide set CBC-1
c. Georgia, slide set CBC-2

Student Manuals:

Georgia, Unit CBC-5

Tools and Equipment:

a. Mortar board
b. Framing square
c. Trowel
d. Level

CLASSROOM HOURS

1

EVALUATION (M-25)

a. Given adequate tools and materials, the student will lay an 8" block corner in stacked bond which is plumb, level and square.

b. Bricklaying Rating Sheet, VICA U.S. Skills Olympics Regulations, VICA, p. 67

TASK

M-26 Building an English corner

PERFORMANCE OBJECTIVE

Build an English corner.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Identify English corner
b. Explain purpose of English corner
c. Identify and explain use of stretcher brick and header brick
d. Layout initial course
e. Plumb and level initial course
f. Lay proceeding courses

Provide Demonstration On:

a. Setting up to build an English corner
b. Building an English corner

Provide Practical Application On:

Setting up for and building an English corner

INSTRUCTIONAL MATERIALS

Textbooks:

Kreh

A/Vs:

Georgia, slide set LBB-1

Student Manuals:

Georgia, Unit LBB-1

Tools and Equipment:

a. Mortar board
b. Framing square
c. Trowel
d. Level

CLASSROOM HOURS 4

EVALUATION (M-26)

a. Given adequate tools and materials, the student will build a return corner in English bond. Work will be accurate, square and plumb.

b. Bricklaying Rating Sheet, VICA U.S. Skills Olympics Regulations, VICA, p. 67

TASK

M-27 Building a Dutch corner

PERFORMANCE OBJECTIVE

Lay a Dutch corner.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Identify and explain purpose of Dutch corner
b. Layout of initial course
c. Plumb and level initial course
d. Lay proceeding courses
e. Plumb and level proceeding courses

Provide Demonstration On:

a. Setting up to build a Dutch corner
b. Building the Dutch corner

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dezettel
b. Kreh

A/Vs:

a. Georgia, slide set LBB-1
b. B.I.A., "Brick Bonds"

Student Manuals:

Georgia, Unit LBB-2

Tools and Equipment:

a. Mortar board
b. Framing square
c. Trowel
d. Level

CLASSROOM HOURS 2

EVALUATION (M-27)

a. Given adequate tools and materials, the student will accurately build a Dutch corner which is square and plumb.

b. Bricklaying Rating Sheet, VICA U.S. Skills Olympics Regulations, VICA, p. 67

TASK

M-28 Laying a Flemish bond

PERFORMANCE OBJECTIVE

Lay a Flemish bond.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Purpose of the Flemish bond
b. How to lay the Flemish bond
c. When to lay a Flemish bond
d. Laying the initial and other courses

Provide Demonstration On:

a. Setting up to lay Flemish bond
b. Laying the Flemish bond

Provide Practical Application On:

Setting up for and laying Flemish bond

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dezettel
b. Kreh

A/Vs:

a. Georgia, slide set LBB-1
b. B.I.A., "Brick Bonds"

Student Manuals:

a. Georgia, Unit LBB-3

Tools and Equipment:

a. Mortar board
b. Framing square
c. Trowel
d. Level

CLASSROOM HOURS 2

EVALUATION (M-28)

a. Given adequate tools and materials, the student will build a 3" wall five courses high in Flemish bond with standard sized brick.

b. Bricklaying Rating Sheet, VICA U.S. Skills Olympics Regulations, VICA, p. 67

TASK

M-29 Laying an English bond

PERFORMANCE OBJECTIVE

Lay an English bond.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Purpose of English bond
b. Lay out of initial course
c. Plumbing and leveling initial course
d. Laying proceeding courses
e. Plumb and level proceeding courses

Provide Demonstration On:

a. Setting up to lay English bond
b. Laying English bond

Provide Practical Application On:

Setting up for and laying English bond

INSTRUCTIONAL MATERIALS

Textbooks:

Dezettel

A/Vs:

a. Georgia, slide set LBB-1
b. B.I.A., "Brick Bonds"

Student Manuals:

a. Georgia, Unit LBB-4

Tools and Equipment:

a. Mortar board
b. Framing square
c. Trowel
d. Level

CLASSROOM HOURS 2

EVALUATION (M-29)

a. Given adequate tools and materials, the student will build a wall 5 courses high in English bond from standard sized brick.

b. Bricklaying Rating Sheet, VICA U.S. Skills Olympics Regulations, VICA, p. 67

TASK

M-30 Making and testing concrete

PERFORMANCE OBJECTIVE

Mix concrete to regulations and test for acceptability.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Mix concrete
b. Identify and explain purpose of cone
c. Determine slump
d. Lab test

Provide Demonstration On:

a. Setting up materials to make and test concrete
b. Making and testing concrete

Provide Practical Application On:

Setting up materials for making and testing concrete

INSTRUCTIONAL MATERIALS

Textbooks:

a. Cook and Trent
b. Dezettel
c. Putnam

A/Vs:

Georgia, slide set CM-1

Student Manuals:

Georgia, Unit CM-1

Tools and Equipment:

a. Mixer
b. Cone
c. Rod

CLASSROOM HOURS 6

EVALUATION (M-30)

Given adequate tools and materials, the student will mix concrete with the proper ratio and consistency.

TASK

M-31 Finishing concrete

PERFORMANCE OBJECTIVE

Finish concrete.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Identify and explain use of a screed
b. Identify and explain use of a hand and ball float
c. Identify and explain use of finishing trowel and edger
d. Identify and explain use of a jointer
e. Identify and explain use of forms
f. Build form and fill with concrete
g. Screed and smooth edges of concrete with hand float
h. Use edger to smooth outside
i. Layout joint lines
j. Trowel concrete to smooth finish

Provide Demonstration On:

a. Setting up materials and equipment to finish concrete
b. Finishing concrete

Provide Practical Application On:

Setting up and finishing concrete

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dezettel
b. Putnam

A/Vs:

Georgia, slide set CM-1

Student Manuals:

Georiga, Unit CM-2

Tools and Equipment:

a. Screed
b. Hand and ball float
c. Finishing trowel and edger
d. Jointer
e. Forms

CLASSROOM HOURS

6

EVALUATION (M-31)

Given adequate tools and materials, the student will demonstrate proper steps in finishing concrete.

TASK

M-32 Estimating concrete

PERFORMANCE OBJECTIVE

Use formulas for estimating concrete.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Explain purpose of estimating concrete
b. Methods used in estimating concrete
c. Use formula to estimate concrete

Provide Demonstration On:

a. Setting up formula for estimating concrete
b. Estimating concrete

Provide Practical Application On:

a. Using proper formula for estimating concrete
b. Using the shorter method for estimating concrete

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dezettel
b. Putnam
c. Wagner

Student Manuals:

Georgia, Units CM-3 and CM-3b

CLASSROOM HOURS 6

EVALUATION (M-32)

Given various slab dimensions, the student will accurately estimate needed concrete within 5%. The student should demonstrate a knowledge of two different methods (formulas) of estimating.

TASK

M-33 Mixing and finishing terrazzo

PERFORMANCE OBJECTIVE

Mix and finish terrazzo.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Uses of terrazzo
b. Mixture of terrazzo
c. Procedure to pour and finish terrazzo
d. Pipe screeding terrazzo
e. Seeding surface

Provide Demonstration On:

a. Mixing terrazzo
b. Seeding surface
c. Troweling the finish
d. Grinding and cleaning the slab

Provide Practical Application On:

Mixing, pouring and finishing terrazzo

INSTRUCTIONAL MATERIALS

A/Vs:

Georgia, slide set TS-1

Student Manuals:

Georgia, Units TS-1, TS-2 and TS-3

Tools and Equipment:

a. 3 inch pipe
b. Hammer
c. Finishing trowel
d. Wet rags
e. 40, 80 and 120 grit stones

CLASSROOM HOURS 8

EVALUATION (M-33)

Given appropriate tools and materials, the student will mix terrazzo, pour into forms, cure and grind to a specified finish. Finished job should be level, ground to an appropriate finish and clean.

TASK

M-34 Estimating masonry materials

PERFORMANCE OBJECTIVE

Estimate the amount of masonry needed for a job.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Masonry materials estimating
b. Formula for estimating brick
c. Formula for estimating concrete block
d. Formula for estimating sand
e. Formula for estimating mortar mix
f. Estimate entire masonry job

Provide Demonstration On:

Estimating the various parts of masonry work

Provide Practical Application On:

Estimating all portions of a masonry job

INSTRUCTIONAL MATERIALS

Student Manuals:

Georgia, Units ME-1a, ME-1b, ME-1c, ME-2a, ME-2b, ME-2c and ME-3

CLASSROOM HOURS 10

EVALUATION (M-34)

Given building plans, the student will make a complete masonry materials and cost estimate, including the following masonry units:

1. Brick
2. Block
3. Sand
4. Mortar mix
5. Concrete

The estimate should be within 5% of predetermined estimates.

TASK

M-35 Setting corner poles

PERFORMANCE OBJECTIVE

Set corner poles for brickwork.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Types of corner poles
b. Layout and lay first course of brick
c. Placing corner pole in proper position at bottom
d. Fastening bottom of story pole
e. Plumbing story pole
f. Fastening top in place
g. Checking for plumb

Provide Demonstration On:

Set up of corner poles.

Provide Practical Application On:

Have student set corner poles.

INSTRUCTIONAL MATERIALS

Textbooks:

B.I.A.

A/Vs:

B.I.A., "Corner Poles"

Student Manuals:

a. B.I.A., Project Sheets
b. B.I.A., Project 32

Tools and Equipment:

a. Mason tool bag
b. Corner poles

CLASSROOM HOURS

2

EVALUATION (M-35)

a. Given corner poles and fittings, the student will set corner poles on a job. Corner poles must be plumb.

b. B.I.A., Bricklaying Vocational Training

TASK

M-36 Laying reinforced brick masonry

PERFORMANCE OBJECTIVE

Lay a wall using reinforced brick masonry.

INSTRUCTIONAL ACTIVITIES

Provide Informaton On:

a. Uses of reinforced brick masonry
b. Sizes of reinforcing rods

Provide Demonstration On:

a. Placement of rods
b. Grouting of cavity

Provide Practical Application On:

Have student lay wall, place rods and grout cavity.

INSTRUCTIONAL MATERIALS

Textbooks:

B.I.A.

Tools and Equipment:

a. Mason tool bag
b. Reinforcing rods
c. Brick and mortar

CLASSROOM HOURS 2

EVALUATION (M-36)

a. Given necessary tools and materials, the student will lay a reinforced brick wall. Wall must be plumb, level and straight. Rods must be placed according to manufacturer's specifications. Grout must be puddled and have no air pockets. Reinforcement wire must be placed horizontally 16 inches on center and must not be exposed to the face of the wall.

b. Performance Guide, V'TECS, p. 57

TASK

M-37 Making reinforced lintels

PERFORMANCE OBJECTIVE

Make a reinforced lintel for an 8" block wall.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Different types of lintels
b. Length of lintel

Provide Demonstration On:

Building temporary term to support work

Provide Practical Application On:

Have student lay bond beam blocks, place reinforcing rods and pour lintel.

INSTRUCTIONAL MATERIALS

Textbooks:

a. B.I.A.
b. Dalzell and Townsend

Tools and Equipment:

a. Form material
b. Saw
c. Bond beam blocks
d. Reinforcing rods
e. Concrete

CLASSROOM HOURS

1

EVALUATION (M-37)

Provided with necessary tools and materials, the student will build a temporary template, lay bond beam blocks, place reinforcing rods and pour concrete in cavity.

TASK

M-38 Setting lintels

PERFORMANCE OBJECTIVE

Set lintel over opening in masonry wall.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Proper bearing on jambs
b. Kinds of lintels
c. Leveling lintel

Provide Demonstration On:

Setting concrete lintel

Provide Practical Application On:

Have student set lintel.

INSTRUCTIONAL MATERIALS

Textbooks:

a. B.I.A.
b. Dalzell and Townsend

Tools and Equipment:

a. Level
b. Lintel
c. Trowel
d. Mortar

CLASSROOM HOURS 1

EVALUATION (M-38)

a. Given necessary tools and equipment, the student will set a concrete lintel. Lintel must be level and the face of lintel plumb with the outside of the wall. Lintel must be bearing at least 6" on each jamb.

b. Performance Guide, V'TECS, p. 78

TASK

M-39 Setting door frames

PERFORMANCE OBJECTIVE

Set door frame in masonry wall.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Tying door frame to wall
b. Bracing door frame
c. Placing struts in frame

Provide Demonstration On:

Setting door frame

Provide Practical Application On:

Have student set, brace and place struts in door frame.

INSTRUCTIONAL MATERIALS

Textbooks:

a. B.I.A.
b. Dalzell and Townsend

Tools and Equipment:

a. Hammer and nails
b. Level
c. Wedges
d. Bracing
e. Saw

CLASSROOM HOURS

1

EVALUATION (M-39)

Provided with tools and materials, the student will set a door frame in a masonry wall. The sides of frame must be standing plumb and straight, the top of frame must be level and the frame must be braced rigidly in place. The student must also demonstrate a knowledge of tying the frame to the wall.

TASK

M-40 Using anchors to tie doors to walls

PERFORMANCE OBJECTIVE

Tie door bucks to wall using anchors.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Types of door frames
b. Types of anchors

Provide Demonstration On:

Placing anchors

Provide Practical Application On:

Have student place anchors and build around them.

INSTRUCTIONAL MATERIALS

Textbooks:

a. B.I.A.
b. Dalzell and Townsend

Tools and Equipment:

a. Mason tool bag
b. Anchors
c. Brick and mortar

CLASSROOM HOURS 1

EVALUATION (M-40)

a. Given T anchors, masonry material, mason's tools and a steel door frame that is set in place, the student will be able to install anchors in door frame and build around them. Anchors must be placed at bottom, middle and top of doorbuck and locked in behind flange according to building specifications. Doorbuck must be level and plumb.

b. Performance Guide, V'TECS, p. 58

TASK

M-41 Setting window frames

PERFORMANCE OBJECTIVE

Set window frame in masonry wall.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Layout procedures
b. Care in handling
c. Safety

Provide Demonstration On:

Setting window

Provide Practical Application On:

Have student layout and set window.

INSTRUCTIONAL MATERIALS

Textbooks:

a. B.I.A.
b. Dalzell and Townsend

Tools and Equipment:

a. Plumb rule
b. 6' folding rule
c. Window
d. Working drawing

CLASSROOM HOURS 1

EVALUATION (M-41)

Given plumb rule, window, 6' folding rule and working drawing, the student will layout and set a window. The sides, bottom and top must fit tightly in opening and the frames must be plumb and square with wall. The window must open, close and lock without binding.

TASK

M-42 Laying soldier course

PERFORMANCE OBJECTIVE

Lay soldier course.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

Uses of soldier courses

Provide Demonstration On:

a. Buttering brick
b. Keeping brick plumb

Provide Practical Application On:

Have student lay soldier course.

INSTRUCTIONAL MATERIALS

Textbooks:

B.I.A.

Tools and Equipment:

a. Mason tool bag
b. Brick
c. Mortar

CLASSROOM HOURS 1

EVALUATION (M-42)

Given necessary tools, brick and mortar, the student will lay a soldier course. Each brick must be standing plumb and the wall must be straight.

TASK

M-43 Laying lowlock sills

PERFORMANCE OBJECTIVE

Layout and lay brick sills.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Projection of brick
b. Lengths of brick
c. Laying out courses using spacing rule
d. Laying brick at each end with proper slope and projection
e. Pulling line on work
f. Laying remaining brick in sill

Provide Demonstration On:

a. Keeping smooth surface
b. Keeping brick tight against window

Provide Practical Application On:

Have student build a sill.

INSTRUCTIONAL MATERIALS

Textbooks:

Ray

Tools and Equipment:

a. Mason tool bag
b. Brick
c. Mortar

CLASSROOM HOURS

1

EVALUATION (M-43)

Given mason tools and supplies, the student will lay a window sill. All brick must be smooth on top of sill, tight against bottom of window and slope to outside. Projection of brick must be equalized.

TASK

M-44 Placing expansion joints

PERFORMANCE OBJECTIVE

Place expansion joint in a masonry wall.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Kinds of expansion joints
b. Uses of expansion joints
c. Determining kind of expansion joint from blueprint
d. Determining place in wall for expansion joint
e. Keeping joint straight and plumb
f. Removing excess mortar from expansion joint

Provide Demonstration On:

Installing expansion joint

Provide Practical Application On:

Have student install expansion joint.

INSTRUCTIONAL MATERIALS

Textbook:

Ray

Tools and Equipment:

Expansion joint

CLASSROOM HOURS 2

EVALUATION (M-44)

Given expansion joint, the student will install the expansion joint in a masonry wall. All mortar and pieces of masonry material must be removed from the joint. The joint must be plumb and straight.

TASK

M-45 Building brick steps

PERFORMANCE OBJECTIVE

Build a set of 3 tread brick steps.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Riser height
b. Tread width
c. Layout of steps
d. Slope of treads
e. Determining number of steps
f. Laying out steps dry
g. Laying flat course
h. Level, straight-edged and square flat course
i. Laying first rowlock course
j. Level, plumb, square and straight-edged
k. Laying alternate flat and rowlock course on remainder of steps
l. Striking and brushing all joints

Provide Demonstration On:

Layout work

Provide Practical Application On:

Have student build a set of 3 tread brick steps.

INSTRUCTIONAL MATERIALS

Textbooks:

B.I.A.

Tools and Equipment:

a. Mason tool bag
b. Brick and mortar

CLASSROOM HOURS	1

EVALUATION (M-45)

a. Provided with mason tools and material, the student will build a set of 3 tread brick steps. Risers should be 7" high and treads 12" wide with a ½" slope on treads to the outside of steps.

b. B.I.A., Plan Reading for Brickmasons.

TASK

M-46 Constructing glazed tile walls

PERFORMANCE OBJECTIVE

Build glazed tile wall.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Composition of glazed tile
b. Colors of glazed tile
c. Cleaning of glazed tile
d. Care of tile
e. Different shapes of tile
f. Laying out dry bond
g. Determining sizes of pieces to be cut
h. Cutting pieces on masonry saw
i. Laying wall

Provide Demonstration On:

a. Laying out bond
b. Cutting pieces
c. Laying glazed tile

Provide Practical Application On:

Have student lay out bond, cut necessary pieces and lay tile wall.

INSTRUCTIONAL MATERIALS

Textbooks:

B.I.A.

Tools and Equipment:

a. Mason tool bag
b. Glazed tile
c. Masonry saw
d. Mortar

CLASSROOM HOURS 2

EVALUATION (M-46)

a. Given mason tools, saw and glazed tile, the student will layout and build a wall using glazed tile. The work should be plumb, level and straight.

b. B.I.A., Bricklaying III

TASK

M-47 Laying structural clay tile

PERFORMANCE OBJECTIVE

Lay structural clay tile.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Types and uses
b. Differences in finishes
c. Methods of laying

Provide Demonstration On:

a. End construction
b. Side construction

Provide Practical Application On:

Have student lay tile.

INSTRUCTIONAL MATERIALS

Textbooks:

B.I.A.

Tools and Equipment:

a. Mason tool bag
b. Structural tile
c. Mortar

CLASSROOM HOURS	2

EVALUATION (M-47)

a. Provided with necessary tools, mortar and structural clay tile, the student will lay tile in end construction and side construction. The work must be plumb, level and straight.

b. Performance Guide, V'TECS, p. 90

TASK

M-48 Waterproofing walls

PERFORMANCE OBJECTIVE

Identify procedures for waterproofing walls.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Kinds of waterproofing
b. How to waterproof

Provide Demonstration On:

Waterproofing walls

Provide Practical Application On:

Have student student study and become familiar with ways to waterproof walls.

INSTRUCTIONAL MATERIALS

Textbooks:

a. B.I.A.
b. Dalzell and Townsend

Student Manuals:

B.I.A., Plan Reading for Brickmasons

CLASSROOM HOURS 2

EVALUATION (M-48)

Given various situations where masonry walls need waterproofing, the student will identify the most appropriate waterproofing methods. The student's answers will be judged correctly from the instructor's professional viewpoint and from published text.

TASK

M-49 Setting stone

PERFORMANCE OBJECTIVE

Set limestone sills and coping.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Safety in handling
b. Method of setting

Provide Demonstration On:

Setting stone

Provide Practical Application On:

Have student set sills and coping.

INSTRUCTIONAL MATERIALS

Textbooks:

B.I.A.

Tools and Equipment:

a. Mason tool bag
b. Stone
c. Wedges
d. Mortar

CLASSROOM HOURS 2

EVALUATION (M-49)

Provided with necessary mason tools and supplies, the student will set limestone sills and coping. The stone should be laid straight and level with joints properly pointed to shed water.

TASK

M-50 Cleaning brickwork

PERFORMANCE OBJECTIVE

Identify masonry stains and clean mortar stains from brickwork.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Safety
b. Proper mixing
c. Methods of cleaning
d. Different stains and causes

Provide Demonstration On:

a. Safety
b. Mixing acid with water

Provide Practical Application On:

Have student clean masonry wall.

INSTRUCTIONAL MATERIALS

Textbooks:

B.I.A.

Tools and Equipment:

a. Scraping tool
b. Brushes
c. Acid
d. Water hose

CLASSROOM HOURS	3

EVALUATION (M-50)

a. Given brushes, scrapers, acid and water hose, the student will mix water and acid in proper proportions and clean mortar stains on brickwork. The student must adhere to all safety rules. The student must also know what causes different stains and various methods of cleaning stains.

b. Performance Guide, V'TECS, p. 30

TASK

M-51 Building tough fireplace and ash pit

PERFORMANCE OBJECTIVE

Lay brick for rough fireplace and ash pit.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Fire hazards
b. Corbeling brick

Provide Demonstration On:

a. Corbeling brick
b. Layout of chimney

Provide Practical Application On:

Have student build a rough fireplace with ash pit.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dalzell and Townsend
b. Ray

A/Vs:

B.I.A., "Fireplace Construction"

Tools and Equipment:

a. Mason's tool bag
b. Brick and mortar

CLASSROOM HOURS

1

EVALUATION (M-51)

Given necessary tools and materials, the student will build a rough fireplace and ash pit according to local building codes.

TASK

M-52 Setting clean-out door

PERFORMANCE OBJECTIVE

Set clean-out door in ash pit wall.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Location Of door
b. Laying out for door

Provide Demonstration On:

a. Preparation of inside wall
b. Setting clean-out door

Provide Practical Application On:

Have student set clean-out door.

INSTRUCTIONAL MATERIALS

Textbooks:

Dalzell and Townsend

Tools and Equipment:

a. Mason tool bag
b. Clean-out door
c. Mortar

CLASSROOM HOURS

1

EVALUATION (M-52)

a. Given a clean-out door and necessary tools, the student will install a clean-out door. The door must be level and air-proof.

b. Performance Guide, V'TECS, p. 64

TASK

M-53 Forming firebox

PERFORMANCE OBJECTIVE

Lay firebrick to form firebox.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Radiant heat
b. Conducted heat
c. Composition of firebrick
d. Mortar for firebrick
e. Theory of fireplaces

Provide Demonstration On:

a. Layout work
b. Laying firebrick
c. Finishing joints

Provide Practical Application On:

Have student build a firebox.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dalzell and Townsend
b. Ray
c. B.I.A.

A/Vs:

B.I.A., "Fireplace Construction"

Tools and Equipment:

a. Mason tool bag
b. Firebrick
c. Mortar

CLASSROOM HOURS 3

EVALUATION (M-53)

a. Given firebrick, mortar and necessary tools, the student will lay firebrick to form a firebox for a fireplace. The student shall keep proper splay and slope to sides and back of firebox to fit the damper.

b. Performance Guide, V'TECS, pp 69-71

TASK

M-54 Setting ash dump

PERFORMANCE OBJECTIVE

Set ash dump in firebox floor.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Composition
b. Locating position of ash dump
c. Measuring size of dump

Provide Demonstration On:

Setting ash dump

Provide Practical Application On:

Have student set ash dump.

INSTRUCTIONAL MATERIALS

Textbooks:

Dalzell and Townsend

Tools and Equipment:

a. Mason tool bag
b. Ash dump

CLASSROOM HOURS

1

EVALUATION (M-54)

a. Given ash dump and proper tools, the student will set an ash dump. The ash dump must fit tightly on the firebox floor.

b. Performance Guide, V'TECS, p. 63

TASK

M-55 Assembling and setting damper

PERFORMANCE OBJECTIVE

Assemble and seal damper in place.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Safety
b. Theory of dampers
c. Sizes and kinds of dampers

Provide Demonstration On:

a. Assembling damper
b. Sealing damper

Provide Practical Application On:

Have student assemble and set damper.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dalzell and Townsend
b. Ray
c. B.I.A.

A/Vs:

B.I.A., "Fireplace Construction"

Tools and Equipment:

a. Mason tool bag
b. Damper
c. Screwdriver
d. Pliers

CLASSROOM HOURS

1

EVALUATION (M-55)

a. Given a damper and proper tools, the student will assemble a damper according to manufacturer's specifications. Set and seal damper in place. Work will be judged correct if no holes or cracks are left in mortar.

b. Performance Guide, V'TECS, p. 65

[illegible]

M-56 Forming wind shelf

PERFORMANCE OBJECTIVE

Place mortar to form wind shelf.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Theory of chimney draft
b. Filling behind back of firebrick with brick, leaving work 2 courses of brick low
c. Spreading mortar on top of fill
d. Smoothing mortar and leave in concave shape
e. Removing excess mortar from damper

Provide Demonstration On:

Forming wind shelf

Provide Practical Application On:

Have student form wind shelf.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dalzell and Townsend
b. Ray

Tools and Equipment:

a. Trowel
b. Mortar

CLASSROOM HOURS 1

EVALUATION (M-56)

a. Given mortar and brick trowel, the student will properly spread and parge mortar to form a wind shelf. The wind shelf must be concaved having no holes or cracks left in the mortar.

b. Dalzell and Townsend, Bricklaying Skill and Practice

TASK

M-57 Building smoke chamber

PERFORMANCE OBJECTIVE

Corbel brick to build smoke chamber.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Corbeling
b. Safety
c. Laying brick around damper, plumb for three courses to clear damper lid
d. Corbeling remaining courses from sides and front until size of flue liner is obtained
e. Parging all work on inside of smoke chamber
f. Removing excess mortar from damper and wind shelf

Provide Demonstration On:

a. Corbeling
b. Parging

Provide Practical Application On:

Have student build smoke chamber.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dalzell and Townsend
b. B.I.A.

A/Vs:

B.I.A., "Fireplace Construction"

Tools and Equipment:

a. Mason tool bag
b. Brick
c. Mortar

CLASSROOM HOURS 2

[redacted] (4-57)

a. Given mortar, brick and mason tools, the student will lay brick to form a smoke chamber. No brick should stick over the brick more than 1 inch. Work should be parged and completely fireproof.

b. Dalzell and Townsend, Bricklaying Skill and Practice

c. B.I.A., Bricklaying III

TASK

M-58 Setting and cutting flue liners

PERFORMANCE OBJECTIVE

Cut and set flue liners over the smoke chamber.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Procedures for cutting
b. Safety
c. Composition of flue liners
d. Sizes of flue liners
e. Shapes of flue liners

Provide Demonstration On:

a. Cutting flue liner
b. Setting flue liner

Provide Practical Application On:

Have student cut and set a flue liner.

INSTRUCTIONAL MATERIALS

Textbooks:

a. B.I.A.
b. Dalzell and Townsend
c. Ray

A/Vs:

B.I.A., "Fireplace Construction"

Tools and Equipment:

a. Mason tool bag
b. Face sheild
c. Flue liners

CLASSROOM HOURS

1

EVALUATION (M-58)

a. Given flue liners and proper tools, the student will set flue liners in mortar bed. Flue liners must be even with the ones under it. Mortar should be smoothed on the inside with no holes left in the mortar joint. The flue liner must be cut on a straight line without cracking.

b. Performance Guide, V'TECS, p.62

TASK

M-59 Topping and capping chimney

PERFORMANCE OBJECTIVE

Lay brick to top out chimney and spread mortar for wash.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Protecting flashing
b. Sloping wash
c. Height of flue liner
d. Height of chimney above roof
e. Lay outside brick of chimney to 18" above ridge
f. Corbel last two courses ½" to outside for drip
g. Filling inside void
h. Placing mortar for wash
i. Sloping wash to outside to shed water
j. Striking joints and brush work

Provide Demonstration On:

Sloping of wash

Provide Practical Application On:

Have student top and cap chimney.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dalzell and Townsend
b. Ray
c. B.I.A.

Tools and Equipment:

a. Mason tool bag
b. Brick
c. Mortar

CLASSROOM HOURS 2

EVALUATION (M-59)

a. Given brick, mortar and mason tools, the student will lay brick to cap out a chimney. Brick should be plumb, level and straight-edged. The student will put wash on chimney with proper slope so as to shed water.

b. B.I.A., Bricklaying Vocational Training

c. Dalzell and Townsend, Bricklaying Skill and Practice

TASK

M-60 Flashing chimney

PERFORMANCE OBJECTIVE

Cut and place flashing in chimney.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Kinds of flashing
b. Placing flashing
c. Sealing flashing
d. Securing flashing

Provide Demonstration On:

a. Cutting flashing
b. Placing flashing
c. Sealing and securing flashing

Provide Practical Application On:

Have student flash chimney without puncturing flashing.

INSTRUCTIONAL MATERIALS

Textbooks:

Dalzell and Townsend

Tools and Equipment:

a. Flashing material
b. Tin snips
c. Pitch

CLASSROOM HOURS

1

EVALUATION (M-60)

a. Given flashing material, pitch and proper tools, the student will flash a chimney. Work must be waterproof, smooth and tightly secured.

b. Performance Guide, V'TECS, p. 84

TASK

M-61 Facing fireplace

PERFORMANCE OBJECTIVE

Lay brick to build face for fireplace.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Types of materials used
b. Fire hazards
c. Methods of bonding
d. Laying out courses to lintel height using brick spacing rule
e. Laying out bond, dry
f. Laying 1st course, using line
g. Continue laying to lintel height
h. Laying out remaining courses to top
i. Continuing laying to top of wall

Provide Demonstration On:

a. Laying out bond
b. Laying brick to firebox edge
c. Proper slushing of joints

Provide Practical Application On:

Have student face fireplace using standard brick.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dalzell and Townsend
b. Ray
c. B.I.A.

Tools and Equipment:

a. Mason tool bag
b. Brick
c. Mortar

CLASSROOM HOURS 2

EVALUATION (M-61)

a. Given brick, mortar and mason tools, the student will lay brick for the face of a fireplace. The brick should be laid plumb, level, straight and tied and flushed to chimney to prevent fire.

b. B.I.A., Bricklaying III

c. Dalzell and Townsend, Bricklaying Skill and Practice

TASK

M-62 Building a hearth

PERFORMANCE OBJECTIVE

Lay brick to build a hearth.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Sizes and shapes of hearths
b. Kinds of material for filling
c. Layout work

Provide Demonstration On:

a. Laying out hearth
b. Proper bonding
c. Finishing top of hearth

Provide Practical Application On:

Have student build a hearth.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dalzell and Townsend
b. Ray
c. B.I.A.

A/Vs:

B.I.A., "Fireplace Construction"

Tools and Equipment:

a. Mason tool bag
b. Brick
c. Mortar

CLASSROOM HOURS

3

EVALUATION (M-62)

Given brick, mortar and necessary tools, the student will be able to lay out and build a hearth for a fireplace. The work will be level, plumb and straight. The hearth will be even with firebox floor.

TASK

M-63 Building single flue chimney

PERFORMANCE OBJECTIVE

Build a single flue chimney.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Proper installation of thimble
b. Safety

Provide Demonstration On:

a. Cutting hole in flue liner
b. Installing thimble

Provide Practical Application On:

Have student build a single flue chimney.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Ray
b. B.I.A.

Student Manuals:

B.I.A., Project 15

Tools and Equipment:

a. Mason tool bag
b. Thimble
c. Clean-out door
d. Brick and mortar

CLASSROOM HOURS

2

EVALUATION (M-63)

Provided with clean-out door, thimble, flue liners, tools, brick and mortar, the student will construct a single flue chimney. The thimble will not project past inside of flue liner. All work will be square, level and plumb.

TASK

M-64 Building bar-b-que pit

PERFORMANCE OBJECTIVE

Lay out and construct a bar-b-que pit.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Desirable locations for bar-b-que pits
b. Locating site
c. Excavating
d. Pouring slab for base
e. Laying out 1st course
f. Laying next two courses
g. Corbel sides of 4th course, 3/4" to the inside
h. Setting 5th course in line with 3rd course
i. Corbeling sides of 6th course same as 4th course
j. Laying 7th and 8th courses in line with 5th course
k. Setting steel rods on top of 8th course
l. Laying remaining courses
m. Striking joints and brush all work

Provide Demonstration On:

a. Method of layout
b. Placing steel rods
c. Corbeling

Provide Practical Application On:

Have student layout and build a bar-b-que pit.

INSTRUCTIONAL MATERIALS

Textbooks:

B.I.A.

Tools and Equipment:

a. Mason tool bag
b. Steel rods
c. Brick
d. Mortar

CLASSROOM HOURS 1

EVALUATION (M-64)

a. Given mason tools, steel rods, brick and mortar, the student will layout and construct a bar-b-que pit. Work will be square, plumb, level, straight and rods will be spaced on 2" centers.

b. B.I.A., Bricklaying III

TASK

M-65 Installing heatilator

PERFORMANCE OBJECTIVE

Install a heatilator.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Design of unit
b. Advantages of unit
c. Components of unit
d. Purpose of insulation

Provide Demonstration On:

a. Positioning the unit
b. Installation of grilles
c. Installing insulation
d. Proper method of laying brick to enclose unit

Provide Practical Application On:

Have student install a heatilator.

INSTRUCTIONAL MATERIALS

Textbooks:

B. I. A.

Tools and Equipment:

a. Mason tool bag
b. Heatilator
c. Brick
d. Mortar
e. Insulation

CLASSROOM HOURS 2

EVALUATION (M-65)

a. Given a heatilator unit, necessary tools and supplies, the student will enclose the heatilator. Insulation must completely cover unit with masonry work without touching unit. All work must be square, plumb, level and straight.

b. Performance Guide, V'TECS, p. 66

TASK

M-66 Building diamond pattern

PERFORMANCE OBJECTIVE

Layout and build a diamond pattern wall.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Uses of pattern walls
b. Importance of workmanship

Provide Demonstration On:

a. Layout of diamond pattern
b. Laying out bond dry
c. Procedure for laying diamond patterns

Provide Practical Application On:

Have student build a panel in the diamond pattern.

INSTRUCTIONAL MATERIALS

Textbooks:

B. I. A.

Student Manuals:

B. I. A., Project 24

Tools and Equipment:

a. Mason tool bag
b. Brick
c. Mortar

CLASSROOM HOURS 1

EVALUATION (M-66)

a. Given necessary tools, light and dark colored brick and mortar, the student will lay a panel in the diamond pattern. The wall must be laid on six or four to eleven with closers occuring every fourth course when opening the diamond and stretchers occuring every fourth course when closing the diamond. The wall must be level, plumb, straight-edged, ranged, pointed and free of cracks and holes.

b. Performance Guide, V'TECS, p. 40

c. Procedure Steps, B. I. A. Project Sheet 24

TASK

M-67 Laying a basket weave pattern

PERFORMANCE OBJECTIVE

Layout and build a basket weave pattern.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Uses of pattern bonds
b. Importance of workmanship
c. Preparing area
d. Jointing and pointing brick

Provide Demonstration On:

a. Layout of basket weave bond
b. Checking pattern

Provide Practical Application On:

Have student layout and build a panel in the basket weave bond.

INSTRUCTIONAL MATERIALS

Textbooks:

B. I. A.

Student Manuals:

B. I. A., Projects 26 and 27

Tools and Equipment:

a. Mason tool bag
b. Brick
c. Mortar

CLASSROOM HOURS

1

EVALUATION (M-67)

a. Provided with tools, brick and mortar, the student will build a panel in the basket weave bond. The brick must be laid on the No. 6 on a brick spacing rule. Vertical and horizontal joints must be straight.

b. Performance Guide, V'TECS, p. 38

c. Procedure Steps, B. I. A. Project Sheets 26 and 27

TASK

M-68 Building a herringbone weave bond

PERFORMANCE OBJECTIVE

Layout and build a herringbone weave bond.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Uses of pattern bonds
b. Importance of workmanship
c. Leveling whole brick on corners

Provide Demonstration On:

a. Layout of herringbone weave bond
b. Drybonding the pattern
c. Squaring dimensions of the desired pattern area

Provide Practical Application On:

Have student layout and build a panel in the herringbone weave bond.

INSTRUCTIONAL MATERIALS

Textbooks:

B. I. A.

Student Manuals:

B. I. A., Projects 28 and 29

Tools and Equipment:

a. Mason tool bag
b. Brick
c. Mortar
d. Masonry saw

CLASSROOM HOURS

1

EVALUATION (M-68)

a. Provided with mason tool bag, brick and mortar, the student will layout, cut proper pieces and build a panel in the herringbone weave bond. All brick in the pattern must be laid at a 45° angle.

b. Performance Guide, V'TECS, p. 43

c. Procedure Steps, B. I. A. Project Sheets 28 and 29

TASK

M-69 Cutting and laying mitre blocks

PERFORMANCE OBJECTIVE

Layout and build panel using mitre blocks.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Uses of ornamental work
b. Cutting the angle

Provide Demonstration On:

a. Cutting mitre
b. Finishing the mitre block by laying up the longest cuts
c. Forming a square block 8" x 8"

Provide Practical Application On:

Have student lay panel.

INSTRUCTIONAL MATERIALS

Textbooks:

B. I. A.

Student Manuals:

B. I. A., Project 30

Tools and Equipment:

a. Mason tool bag
b. Masonry saw
c. Brick
d. Mortar

CLASSROOM HOURS 1

EVALUATION (M-69)

a. Given tools, brick and mortar, the student will lay out panel, cut brick and lay brick to construct a mitre block panel. Work must be straight, level and plumb.

b. Procedure Steps, B.I.A. Project Sheet 30

TASK

M-70 Building a jack arch

PERFORMANCE OBJECTIVE

Cut and build a jack arch.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Special problems in building
b. Types of archs
c. Parts of arch
d. Layout of arches

Provide Demonstration On:

a. Cutting brick for soffit
b. Layout work

Provide Practical Application On:

Have student cut brick and lay a jack arch.

INSTRUCTIONAL MATERIALS

Textbooks:

B. I. A.

Student Manuals:

B. I. A. Project 19

Tools and Equipment:

a. Mason tool bag
b. Masonry saw
c. Brick and mortar
d. Angle iron

CLASSROOM HOURS

1

EVALUATION (M-70)

Given mason tools and materials, the student will lay out, cut and lay brick for a jack arch. The work should be straight, level and plumb. The soffit of the arch should be cut straight.

TASK

M-71 Building a segmental arch

PERFORMANCE OBJECTIVE

Build a segmental arch.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Types of arches
b. Uses of arches
c. Names of parts

Provide Demonstration On:

a. Lay out
b. Cutting skewback
c. Cutting creepers

Provide Practical Application On:

Have student build a segmental arch.

INSTRUCTIONAL MATERIALS

Textbooks:

B. I. A.

Tools and Equipment:

a. Mason tool bag
b. Temporary center
c. Brick and mortar
d. Masonry saw

CLASSROOM HOURS 1

EVALUATION

(M-71)

Given tools, temporary center and materials, the student will lay out and build a segmental arch. The brick in the arch must fit tightly against temporary center. The work should be plumb.

TASK

M-72 Building soldier arch

PERFORMANCE OBJECTIVE

Build a soldier arch.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Uses of arch
b. Weakness of arch
c. Locating arch form
d. Using creepers

Provide Demonstration On:

a. Drybonding bricks
b. Laying soldier course around form
c. Cutting and placing creepers
d. Placing and bracing form

Provide Practical Application On:

Have student build a soldier arch.

INSTRUCTIONAL MATERIALS

Textbooks:

B. I. A.

Student Manual:

B. I. A., Project 20

Tools and Equipment:

a. Mason tool bag
b. Brick
c. Mortar
d. Angle iron

CLASSROOM HOURS

1

EVALUATION (M-72)

Given necessary tools and materials, the student will build a soldier arch. The wall must not crack when wood center is released. The soldier arch must be in line with face of wall and bed joints must be uniform around the arch. The bottom of the arch (soffit) must be flush and free of holes and stretcher course across the top of the arch must not be interrupted by arch height or cuts in the wall.

TASK

M-73 Laying glass blocks

PERFORMANCE OBJECTIVE

Lay glass blocks.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Uses of glass blocks
b. Precautions in handling
c. Expansion joints
d. Wall ties

Provide Demonstration On:

a. Installing expansion joint
b. Methods of laying

Provide Practical Application On:

Have student lay glass blocks.

INSTRUCTIONAL MATERIALS

Textbooks:

B.I.A.

Tools and Equipment:

a. Mason tool bag
b. Rubber tip for trowel handle
c. Glass block
d. Mortar

CLASSROOM HOURS

2

EVALUATION (M-73)

a. Given tools and materials, the student will lay glass blocks. Work must be straight, plumb and level. The expansion joint must be properly installed around the perimeter.

b. Performance Guide, V'TECS, p. 85

TASK

M-74 Laying walks and floors

PERFORMANCE OBJECTIVE

Lay masonry walks and floors.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Special precautions
b. Different patterns
c. Ways of construction

Provide Demonstration On:

a. Mortar joint paving
b. Drybonding from center brick to opposite sides
c. Spreading grout

Provide Practical Application On:

a. Have student lay out and install a walk or floor made of brick.
b. Grout all joints full.

INSTRUCTIONAL MATERIALS

Textbooks:

a. B.I.A.
b. Dalzell and Townsend

Student Manuals:

B.I.A. Projects 25 and 26

Tools and Equipment:

a. Mason tool bag
b. Paving brick
c. Mortar

CLASSROOM HOURS

2

EVALUATION (M-74)

a. Given tools, mortar and paving brick, the student will lay paving brick. The surface of the brick must be level with all of the holes and joints pointed and jointed to shed water.

b. Performance Guide, V'TECS, pp 86-7

TASK

M-75 Building planters

PERFORMANCE OBJECTIVE

Lay out and build planters.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Use of weep holes
b. Placing of weep holes
c. Layout of planters
d. Kinds and shapes of planters

Provide Demonstration On:

a. Keeping weep holes clear of mortar
b. Lay out work
c. Digging and pouring footings
d. Drybonding bricks where planter is to be built

Provide Practical Application On:

Have student construct planter and finish face wall according to joint desired.

INSTRUCTIONAL MATERIALS

Textbook:

B.I.A.

Tools and Equipment:

a. Mason tool bag
b. Brick

CLASSROOM HOURS 2

EVALUATION (M-75)

a. Given tools and supplies, the student will lay out and construct a planter. All weep holes must be kept clear of mortar. The planter must be straight, level, square and plumb.

b. Performance Guide, V'TECS, p. 83

TASK

M-76 Building garden walls

PERFORMANCE OBJECTIVE

Lay out and build a garden wall.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Design of wall
b. Type of brick to use
c. Types of coping
d. Laying out bond dry in proper bond
e. Building corner leads
f. Attaching line
g. Filling in remaining courses
h. Striking all joints

Provide Demonstration On:

Layout of a wall

Provide Practical Application On:

Have student layout and build one design of a garden wall.

INSTRUCTIONAL MATERIALS

Textbooks:

B.I.A.

A/V:

B.I.A., "Brick in Landscape Design"

Tools and Equipment:

a. Mason tool bag
b. Brick and mortar

CLASSROOM HOURS 1

EVALUATION (M-76)

a. Provided with mason tools, brick and mortar, the student will build a garden wall with a brick cap. The cap must be laid with full joints and pointed up so as to shed water.

b. B.I.A., Bricklaying Vocational Training

SECTION VI

REFERENCES, RESOURCES

RESOURCES

Instructional Resource Matrix

The Instructional Resource Matrix lists the instructional resources required to carry out the learning activities in each unit in the program. The resources are divided into the categories of audio visuals, textbooks and student materials.

Audio visuals are identified by the following symbols: filmstrips (FS), slides (S), slide/tapes (ST), tapes (T), videotapes (VT), transparencies (TR) and film loops (FL).

Textbooks are identified by the author(s)/publisher and title.

Student Materials (instructional units) are identified by publisher and title.

Textbook List

This list identifies the textbooks referenced in the Unit Guide section and on the Instructional Resource Matrix.

Instructional Units

The publishers of the instructional units referenced on the Unit Guides and the Instructional Resource Matrix are listed.

Audio Visuals

The suppliers of the audio visuals referenced on the Unit Guides and the Instructional Resource Matrix are listed.

Additional Instructional Resources

This section lists instructional resources which may be used in addition to those primary resources listed on the Unit Guides.

The resources are divided into three categories.

Textbooks: This section provides a list of textbooks in addition to those referenced on the Unit Guides. Also identified are the types of audio visuals available.

Audio Visuals: This listing provides the names of audio visual suppliers in addition to those referenced on the Unit Guides. Also identified are the types of audio visuals available.

Individualized Instruction: Suppliers of individualized instruction materials, in addition to those referenced on the Unit Guides, are identified.

RESOURCE ADDRESSES

Addresses of instructional materials referenced on the Unit Guides and in the Additional Instructional Resources section are given.

CURRICULUM AREA: Masonry

TASK LISTING		INSTRUCTIONAL MATERIAL REFERENCES		
		Audio-Visuals	Textbooks	Student Materials
M-01	Spreading mortor	Georgia: BSB-1 (ST)	Dezettel; Kreh; Putnam	Georgia: Unit BSB-1
M-02	Laying brick to a line	Georgia: BSB-2 (ST)	Cook and Trent; Dezettel	Georgia: Unit BSB-2; Kreh: Unit 15
M-03	Building a brick corner	Georgia: BSB-3 (ST)	Dezettel; Putnam	Georgia: Unit BSB-3; Kreh: Unit 16
M-04	Cutting brick and block	Georgia: BSB-4 (ST)	Dezettel; Kreh; Putnam	Georgia: Unit BSB-4
M-05	Determining spacing for standard size brick	Georgia: BSR-1 (ST)	Putnam	Georgia: Unit BSR-1
M-06	Laying courses to sill and cornice height		Dezettel; Putnam	Georgia: Unit BSR-2
M-07	Interpreting and using a line modular rule	Georgia: BSR-3 (ST)	Dezettel; Kreh	Georgia: Unit BSR-3
M-08	Dimensioning and scaling a working drawing		B.I.A.	
M-09	Identifying names and uses of lines and symbols on a working drawing		B.I.A.	
M-10	Identifying different views and their uses on a working drawing		B.I.A.	
M-11	Setting batter boards	B.I.A.: "Laying Out a Foundation" (ST)	Dalzell and Townsend	B.I.A.: Project 34
M-12	Inspecting grading at building site		B.I.A.; Dalzell and Townsend	

CURRICULUM AREA: Masonry

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
M-13 Finishing grading at building site		B.I.A.; Dalzell and Townsend	
M-14 Setting frames for footing and foundations		Dalzell and Townsend	
M-15 Installing steel reinforcing		Dalzell and Townsend	
M-16 Operating a transit		B.I.A.	
M-17 Pouring footing		Dalzell and Townsend	
M-18 Laying an 8" wall with header	Georgia: DBW-1 (ST)	Dezettel; Putnam	Georgia: Unit DBW-1
M-19 Building an L shaped 8" wall with header coursed, header caps and rollocks	Georgia: DBW-1 (ST)	Dezettel	Georgia: Units DBW-2, DBW-3 and DBW-4; Kreh: Unit 22
M-20 Constructing cavity walls		B.I.A.; Dalzell and Townsend	B.I.A., Project 7
M-21 Laying a 4" block corner in running bond	Georgia: CD-1, CBC-1 and CBC-2 (ST)	Dezettel; Kreh; Putnam	Georgia: Unit CBC-2
M-22 Laying an 8" block corner in running bond	Georgia: CD-1, CBC-1 and CBC-2 (ST)	Dezettel; Kreh; Putnam	Georgia: Unit CBC-1
M-23 Building a 6" block corner in running bond	Georgia: CD-1, CBC-1 and CBC-2 (ST)	Dezettel; Kreh; Putnam	Georgia: Unit CBC-3

CURRICULUM AREA: Masonry

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
M-24 Building a 12" block corner in running 1/2 bond	Georgia: CD-1, CBC-1 and CBC-2 (ST)	Dezettel; Kreh; Putnam	Georgia: Unit CBC-4
M-25 Laying a block corner in stacked bond	Georgia: CD-1, CBC-1 and CBC-2 (ST)	Dezettel; Kreh; Putnam	Georgia: Unit CBC-5
M-26 Building an English corner	Georgia: LBB-1 (ST)	Kreh	Georgia: Unit LBB-1
M-27 Building a Dutch corner	Georgia: LBB-1 (ST); B.I.A.: "Brick Bonds" (ST)	Dezettel; Kreh	Georgia: Unit LBB-2
M-28 Laying a Flemish bond	Georgia: LBB-1 (ST); B.I.A.: "Brick Bonds" (ST)	Dezettel	Georgia: Unit LBB-3
M-29 Laying an English bond	Georgia: LBB-1 (ST); B.I.A.: "Brick Bonds" (ST)	Dezettel	Georgia: Unit LBB-4
M-30 Making and testing concrete	Georgia: CM-1 (ST)	Dezettel; Putnam; Cook and Trent	Georgia: Unit CM-1
M-31 Finishing concrete	Georgia: CM-1 (ST)	Dezettel; Putnam	Georgia: Unit CM-2
M-32 Estimating concrete		Dezettel; Putnam; Wagner	Georgia: Units CM-3 and CM-3b
M-33 Mixing and finishing terrazzo	Georgia: TS-1 (ST)		Georgia: Units TS-1, TS-2 and TS-3
M-34 Estimating masonry materials			Georgia: Units ME-1a, ME-1b, ME-1c, ME-2a, ME-2b, ME-2c and ME-3
M-35 Setting corner poles	B.I.A.: "Corner Poles" (ST)	B.I.A.	B.I.A.: Project 32

CURRICULUM AREA: Masonry

TASK LISTING		INSTRUCTIONAL MATERIAL REFERENCES		
		Audio-Visuals	Textbooks	Student Materials
M-36	Laying reinforced brick masonry		B.I.A.	
M-37	Making reinforced lintels		Dalzell and Townsend	
M-38	Setting lintels		B.I.A.; Dalzell and Townsend	
M-39	Setting door frames		B.I.A.; Dalzell and Townsend	
M-40	Using anchors to tie doors to walls		B.I.A.; Dalzell and Townsend	
M-41	Setting window frames		Dalzell and Townsend	
M-42	Laying soldier course		B.I.A.	
M-43	Laying rowlock sills		Ray	
M-44	Placing expansion joints		Ray	
M-45	Building brick steps		B.I.A.	
M-46	Constructing glazed tile walls		B.I.A.	
M-47	Laying structural clay tile		B.I.A.	
M-48	Waterproofing walls		B.I.A.; Dalzell and Townsend	
M-49	Setting stone		B.I.A.	
M-50	Cleaning brickwork		B.I.A.	

CURRICULUM AREA: Masonry

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
M-51 Building a rough fireplace and ash pit	B.I.A.: "Fireplace Construction" (ST)	Dalzell and Townsend; Ray	
M-52 Setting clean-out door		Dalzell and Townsend	
M-53 Forming firebox	B.I.A.: "Fireplace Construction" (ST)	Dalzell and Townsend; Ray; B.I.A.	
M-54 Setting ash dump		Dalzell and Townsend	
M-55 Assembling and setting damper	B.I.A.: "Fireplace Construction" (ST)	Dalzell and Townsend; Ray; B.I.A.	
M-56 Forming wind shelf		Dalzell and Townsend; Ray	
M-57 Building smoke chamber	B.I.A.: "Fireplace Construction" (ST)	Dalzell and Townsend	
M-58 Setting and cutting flue liners	B.I.A.: "Fireplace Construction" (ST)	Dalzell and Townsend; Ray	
M-59 Topping and capping chimney		Dalzell and Townsend; Ray; B.I.A.	
M-60 Flashing chimney		Dalzell and Townsend	
M-61 Facing fireplace		Dalzell and Townsend; Ray; B.I.A.	

CURRICULUM AREA: Masonry

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
M-62 Building a hearth	B.I.A.: "Fireplace Constuction" (ST)	Dalzell and Townsend; Ray; B.I.A.	
M-63 Building single flue chimney		Ray; B.I.A.	B.I.A.: Project 15
M-64 Building bar-b-que pit		B.I.A.	
M-65 Install a heatilator		B.I.A.	
M-66 Building diamond pattern		B.I.A.	
M-67 Laying a basket weave pattern		B.I.A.	B.I.A.: Projects 26 and 27
M-68 Building a herringbone weave bond		B.I.A.	B.I.A.: Projects 28 and 29
M-69 Cutting and laying mitre blocks		B.I.A.	B.I.A.: Project 30
M-70 Building a jack arch		B.I.A.	B.I.A.: Project 19
M-71 Building a segmented arch		B.I.A.	B.I.A.: Project 17
M-72 Building a soldier arch		B.I.A.	B.I.A.: Project 20
M-73 Laying glass blocks		B.I.A.	
M-74 Laying walks and floors		B.I.A.; Dalzell and Townsend	B.I.A.: Projects 25 and 26
M-75 Building planters		B.I.A.	
M-76 Building garden walls	B.I.A.: "Brick in Landscape Design" (ST)	B.I.A.	

TEXTBOOK LIST

A Catalog of Performance Objectives, Criterion-Referenced Measures and Performance Guides in Masonry. Vocational Technical Consortium of States (V-TECS), 1976.

Cook, G. and Trent, R., An Analysis of the Masonry Occupation. Columbus, OH: Instructional Materials Laboratory, Ohio State University, 1976.

Dalzell, R. and Townsend, G., Masonry Simplified: Tools, Materials, Practices. (3rd ed.). Chicago: American Tech.

Dezettel, L. M., Masons and Builders Library. (Volumes one and two, 2nd ed.). Indianapolis, IN: Audel, 1972; (Available from Bobbs-Merrill).

Kicklighter, C. E., Modern Masonry. South Holland, IL: Goodheart-Willcox, 1980.

Kreh, R. T., Advanced Masonry Skills. Albany, NY: Delmar Publishers, 1978.

Kreh, R. T., Masonry Skills. Albany, NY: Delmar Publishers, 1976.

Plan Reading for Brickmasons. McLean, VA: Brick Institute of America, 1968.

Putnam, R. E., Bricklaying Skills and Practice. Chicago, IL: American Tech, 1974.

Putnam, R. E., Concrete Block Construction. Chicago, IL: American Tech, 1973.

Ray, J. E., The Art of Bricklaying. Peoria, IL: Charles A. Bennett Co., 1976.

Roark, W. F. and Plummer, H. C., Bricklaying Vocational Training: Instructor's Guide. McLean, VA: Brick Institute of America, 1973.

Roark, W. F. and Plummer, H. C., Bricklaying Vocational Training: Student Textbook. McLean, VA: Brick Institute of America, 1973.

Roark, W. F. and Plummer, H. C., Bricklaying Vocational Training: Study Guide. McLean, VA: Brick Institute of America, 1973.

Wagner, W. H., Modern Carpentry. South Holland, IL: Goodheart-Willcox, 1979.

AUDIO-VISUALS

Georgia (VEMC) B.I.A. (Brick Institute of America)

INSTRUCTIONAL UNITS

Instructional units listed in the Unit Guides and Instructional Resource Matrix may be obtained from these two sources.

1. Georgia - Produced for the Georgia Department of Education and available from:

   University of Georgia
   College of Education
   Division of Vocational Education
   Vocational Education
   Materials Center

2. B.I.A. - Produced by the Brick Institute of America and available from:

   Brick Institute of America
   Region Nine Office

ADDITIONAL INSTRUCTIONAL RESOURCES

Textbooks

Concrete and Concrete Masonry. St. Paul: Hobar Publications.

Concrete and Masonry. Washington: Department of the Army, 1970.

Cook, G. and Trent, R., An Analysis of the Masonry Occupation. Columbus, OH: Instructional Materials Laboratory, Ohio State University, 1976.

Dalzell, R. and Townsend, G., Bricklaying Skill and Practice. Chicago: American Tech, 1967.

Dalzell, R. and Townsend, G., Concrete Block Construction for Home and Farm. Chicago: American Tech.

DeCristoforo, R.J., Concrete and Masonry: Techniques and Design. Tarrytown, NY: Prentice-Hall, 1975.

Eastman, M. and Eastman, W.F., Planning and Building Your Fireplace. Charlotte, VT: Garden Way Publishing, 1976.

Maguire, B., Masonry and Concrete. Tarrytown, NY: Prentice-Hall, 1978.

Masonry Competencies. Sanford, NC: Sanford Research Project, 1972.

Mathematics I - For Masons. New Brunswick, NJ: Vocational Technical Curriculum Laboratory, Rutgers, 1959.

National Apprenticeship and Training Standards for Cement Masonry, Asphalt and Composition Trade. Washington: U.S. Department of Labor, Bureau of Apprenticeship and Training, 1974.

Quality Concrete. St. Paul: Hobar Publications.

Recommended Practices for Laying Concrete Block. St. Paul: Hobar Publications, 1980.

Smith, R.C., Honkala, T.L. and Andres, C.K., Masonry: Materials, Design and Construction. Tarrytown, NY: Prentice-Hall, 1979.

Audio Visuals

Automated Training, Inc.	Sound filmstrips 16 mm Snap-in cartridge
Bobbs- Merrill	Slides/tapes
Career Aids, Inc.	Sound filmstrips
Colonial Films	16 mm films Sound filmstrips
Daystar Audio Visual	Sound filmstrips
DCA Educational Products	Sound filmstrips
Encyclopedia Britannica Education Corp.	Sound filmstrips
Eye Gate House, Inc.	Sound filmstrips
Hobar Publications	Transparencies
Instructional Materials Laboratory, University of Missouri	Slides/tapes
National Film Board of Canada	Sound filmstrips
Robert Brady Co.	Sound filmstrips
Society for Visual Education, Inc.	Sound filmstrips
University of Illinois, Vocational/Agriculture Service	Sound filmstrips
Vocational Education Media Center, Clemson University	Transparencies

Individualized Instruction

Associated General Contractors (available from Oklahoma State Department of Vocational and Technical Education)	Cement Masons Curriculum Bricklaying Curriculum

Curriculum

Ahl, C., Masonry: Teacher's Guide. New Brunswick, NJ: Vocational-Technical Curriculum Laboratory, Rutgers, 1973.

Building Trades: Masonry Guide. NE: Nebraska Department of Education, 1975.

Concrete and Masonry: Technical Manual. WA: Washington Department of the Army, 1970.

Day, G.F. and Herschback, D.R., Resource Guide for Performance Based Masonry Instruction. College Park, MD: Department of Industrial Education, University of Maryland, 1977.

Elquist, Hugh, et al., Course for Cement Masons. CA: California State Department of Education, Bureau of Industrial Education, 1968.

Grimes, L.A., Jr., Supervised Study Manual for Bricklayer and Stonemason. Austin, TX: Instructional Materials Service, University of Texas, 1973.

Heppa, V., Basic Estimating for Masons. New Brunswick, NJ: Vocational-Technical Curriculum Laboratory, Rutgers, 1963.

Heppa, V., Blueprint Reading for Masons. New Brunswick, NJ: Vocational-Technical Curriculum Laboratory, Rutgers, 1963.

Masonry: Instructor's Guide. (Preparation level. Construction Industry series.) Texas Education Agency, 1975. (Available from U.S. Govt. Printing Office)

Trade Masonry Syllabus. NY: New York State Education Department, 1972.

RESOURCE ADDRESSES

American Tech
5608 Stony Island Avenue
Chicago, IL 60637

Automated Training, Inc.
Box 34707
Charlotte, NC 28234

Bobbs-Merrill Educational
Publishing
4300 West 62nd Street
P.O. Box 7080
Indianapolis, IN 46206

Brick Institute of America
Region Nine Office
100 Northcreek-Suite 280
Atlanta, GA 30327

California State Department
of Education
Bureau of Industrial Education
721 Capitol Mall
Sacramento, CA 95814

Career Aids, Inc.
8950 Lurline Avenue, Dept. T7
Chatsworth, CA 91311

Charles A. Bennett Co., Inc.
809 West Detweiller Drive
Peoria, IL 61615

Colonial Films
752 Spring Street, N.W.
Atlanta, GA 30308

Daystar Audio Visual
3 Inverness Drive East
Englewood, CO 80112

DCA Educational Products, Inc.
Subsidiary of Display
Corporation of America
424 Valley Road
Warrington, PA 18976

Department of Industrial
Education
University of Maryland
College Park, MD 20742

Encyclopedia Britannica
Educational Corporation
425 N. Michigan Avenue
Chicago, IL 60611

Eye Gate House, Inc.
146-01 Archer Avenue
Jamaica, NY 11435

Garden Way Publishing
Charlotte, VT 05445

Goodheart-Willcox Co., Inc.
123 W. Taft Drive
South Holland, IL 60473

Headquarters
Department of the Army
Washington, D.C.

Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112

Instructional Materials
Laboratory
10 Industrial Education
Building
University of Missouri-Columbia
Columbia, MO 65211

Instructional Materials
Laboratory
Trade and Industrial Education
Ohio State University
Columbus, OH 43210

National Film Board of Canada
1251 Avenue of the Americas
New York, NY 10020

Nebraska Department of
Education
Division of Vocational
Education
2333 S. Tenth Street
Lincoln, NE 68508

New York State Education Dept.
Bureau of Secondary Curriculum
Development
Albany, NY 12224

Oklahoma State Department of
Vocational and Technical
Education
1515 W. Sixth Street
Stillwater, OK 74074

Prentice-Hall Media
Serv Code XF
150 White Plains Road
Tarrytown, NY 10591

Robert Brady Co.
150 White Plains Road
Tarrytown, NY 10591

Sanford Research Project
Sanford, NC 27330

Society for Visual Education,
Inc.
Division of Singer Co.
1345 Diversey Parkway
Chicago, IL 60614

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

University of Georgia
College of Education
Division of Vocational Education
Vocational Education Materials
Center
Green Street
Athens, GA 30602

University of Illinois
Visual Aids Service
1325 S. Oak
Champaign, IL 61820

University of Illinois
Vocational Agriculture Service
434 Mumford Hall
Urbana, IL 61801

University of Texas
Division of Extension
Instructional Materials Service
Austin, TX

U.S. Department of Labor
Bureau of Apprenticeship
and Training
Washington, DC 20210

Vocational Education Media
Center
Clemson University
Clemson, SC 29631

Vocational-Technical Curriculum
Laboratory
Rutgers University
Building 4103
Kilmer Campus
New Brunswick, NJ 08903

SECTION VII

STUDENT RECORDS

STUDENT RECORDS

This section contains three forms, the Individual Progress Report Chart, the Group Progress Chart and the Student Competency Record. The use of these charts is described below.

INDIVIDUAL PROGRESS REPORT. One copy should be kept in each student's confidential file and updated as tasks are completed. Grades should be assigned upon task completion and then averaged for grade reporting. Difficulty, excessive amounts of time, etc. should be noted on this form and should be discussed with the student and/or parents.

GROUP PROGRESS CHART. This chart reflects task completion only and can be displayed in the classroom or lab area. Due to confidentiality of records, a grade must not be recorded. The instructor should maintain a copy of this record and update it daily.

STUDENT COMPETENCY RECORD. This record provides a listing of all tasks or units in the program, a space designated for the student's name, D.O.T. numbers and job title and a check off column for date of task completion. The D.O.T. number and job title should be filled in when the student leaves the program for any reason. The information will indicate his/her qualifications for a job. This information will be especially useful to early leavers who have not completed the total program. The Task Listing/D.O.T. Code Cross Reference Table in Section III contains the information required to identify the particular job title for which the student is qualified.

The following is a list of tasks which will enable a student to meet the requirements for the identified occupation.

Cement Mason Helper (869.687-026)

01
20
21
25
27
28
29
31
35
45

Bricklayer Helper (861.687-010)

01
02
04
07
25
27
29
35
38
45
47

Stone Mason Helper (869.687-026)

01
04
07
27
29
46

Cement Mason (844.369-010)

01
20
21
22
23
25
26
27
28
29
30
31
45

Stone Mason (861.381-038)

01
04
07
26
27
29
35
46

Bricklayer Construction (863.381-018)

01-76

INDIVIDUAL PROGRESS REPORT

NAME ____________________

PROGRAM/ CLUSTER ____________________ AREA ____________________

TASK/ UNIT NO.	UNIT TITLE	DATE STARTED	DATE COMP.	EST. TIME	GRADE

GROUP PROGRESS CHART

NAME	UNITS/TASKS																			

RECORD OF DEMONSTRATED JOB COMPETENCIES

STUDENT NAME ______________________________ PROGRAM ______________________________

DICTIONARY OF OCCUPATIONAL TITLES JOB CLASSIFICATION: D.O.T. No. ______________________________

JOB TITLE ______________________________

Unit No.	Competency Demonstrated	Initial Date
	Performing Basic Bricklaying Manipulations	
01	Spreading Morter	
02	Laying Brick to a Line	
03	Building a Brick Corner	
04	Cutting Brick and Block	
	Using a Brick Spacing Rule	
05	Determining Spacing for Standard Sized Brick	
06	Laying Out Courses to Sill and Cornice Height	
07	Interpreting and Using a Line Modular Rule	
	Using Working Drawings	
08	Dimensioning and Scaling a Working Drawing	
09	Identifying Names and Uses of Lines and Symbols on a Working Drawing	
10	Identifying Different Views and Their Uses on a Working Drawing	
	Preparing Footings and Foundations	
11	Setting Batter Boards	
12	Inspecting Grading at Building Site	
13	Finishing Grading at Building Site	
14	Setting Frames for Footing/Foundations	
15	Installing Steel Reinforcing	
16	Operating a Transit	
17	Pouring Footing	
	Building Double Brick Walls	
18	Laying an Eight Inch Wall with Header	
19	Building an L Shaped Eight Inch Wall with Header Courses, Header Caps and Rowlocks	
20	Constructing Cavity Walls	
	Building Block Corners	
21	Laying a Four Inch Block Corner in Running Bond	
22	Laying an Eight Inch Block Corner in Running Bond	
23	Building a Six Inch Block Corner in Running Bond	
24	Building a Twelve Inch Block Corner in Running 1/2 Bond	
25	Laying a Block Corner in Stacked Bond	
	Laying Brick Bonds	
26	Building an English Corner	
27	Building a Dutch Corner	
28	Laying a Flemish Bond	
29	Laying an English Bond	
	Laying Concrete Slabs	
30	Making and Testing Concrete	
31	Finishing Concrete	
32	Estimating Concrete	
	Mixing and Finishing Terrazzo	
33	Mixing and Finishing Terrazzo	
	Estimating Masonry Materials	
34	Estimating Masonry Materials	
	Constructing Buildings	
35	Setting Corner Poles	
36	Laying Reinforced Brick Masonry	
37	Setting Lintels	
38	Making Reinforced Lintels	
39	Setting Door Frames	
40	Using Anchors to Tie Doors to Walls	
41	Setting Window Frames	
42	Laying Soldier Courses	
43	Laying Rowlock Sills	
44	Placing Expansion Joints	
45	Building Brick Steps	
46	Constructing Glazed Tile Walls	
47	Laying Structural Clay Tile	
48	Waterproofing Walls	
49	Setting Stone	
50	Cleaning Brickwork	
	Constructing Chimneys and Fireplaces	
51	Building Rough Fireplace and Ash Pit	
52	Setting Clean-Out Door	
53	Forming Firebox	
54	Setting Ash Dump	
55	Assembling and Setting Damper	
56	Forming Wind Shelf	
57	Building Smoke Chamber	
58	Setting and Cutting Flue Liners	
59	Topping and Capping Chimney	

Unit No.	Competency Demonstrated	Initial Date	Unit No.	Competency Demonstrated	Initial Date
60	Flashing Chimney		67	Laying a Basket Weave Bond	
61	Facing Fireplace		68	Laying a Herringbone Weave Bond	
62	Building Hearth		69	Cutting and Laying Mitre Blocks	
63	Building Single Flue Chimney		70	Building a Jack Arch	
64	Building Bar-B-Que Pit		71	Building a Segmental Arch	
65	Installing Heatilator		72	Building a Soldier Arch	
			73	Laying Glass Blocks	
	Laying Brick for Ornamental Purposes		74	Laying Walks and Floors	
			75	Building Planters	
66	Building a Diamond Pattern Wall		76	Building Garden Walls	

This is to certify that the student has demonstrated proficiency in the performance of the tasks and/or competencies indicated on the previous page. These tasks and/or competencies have been determined to be the skills and knowledge that are necessary for entry level employment into the job classification indicated.

Date ______________________________ Instructor ______________________________

School ______________________________

SECTION VIII

SPECIAL NEEDS STUDENT

WORKING WITH SPECIAL NEEDS STUDENTS

Introduction

Special needs students are those who are designated as handicapped and/or disadvantaged. The 1976 vocational education amendment defines handicapped individuals as:

> Persons who are mentally retarded, hard of hearing, deaf, speech impaired, visually handicapped, seriously emotionally disturbed, orthopedically impaired, health impaired, or persons with other specific disabilities, who by reason thereof require special education and related services and who cannot succeed in the regular vocational education programs.

In Title II of the 1976 education amendments disadvantaged persons are defined as:

> Persons (other than handicapped persons) who have academic or economic disadvantages and who require special services, assistance or programs in order to enable them to succeed in vocational education programs.

Federal legislation requires that these special people be given an opportunity to function in a regular classroom. This section provides information on how special needs students are identified and how they can be mainstreamed into regular educational environments.

Figure One presents a model depicting various activities of the process in identifying and mainstreaming special needs students. These activities are conducted at three levels: the system level, the school level and the classroom level. All three levels must work together if implementation of the process is to be effective.

Identification Of The Special Needs Student

Through a variety of pre-testing procedures, special needs students are identified and their potentials are evaluated at the

SPECIAL NEEDS MAINSTREAMING MODEL

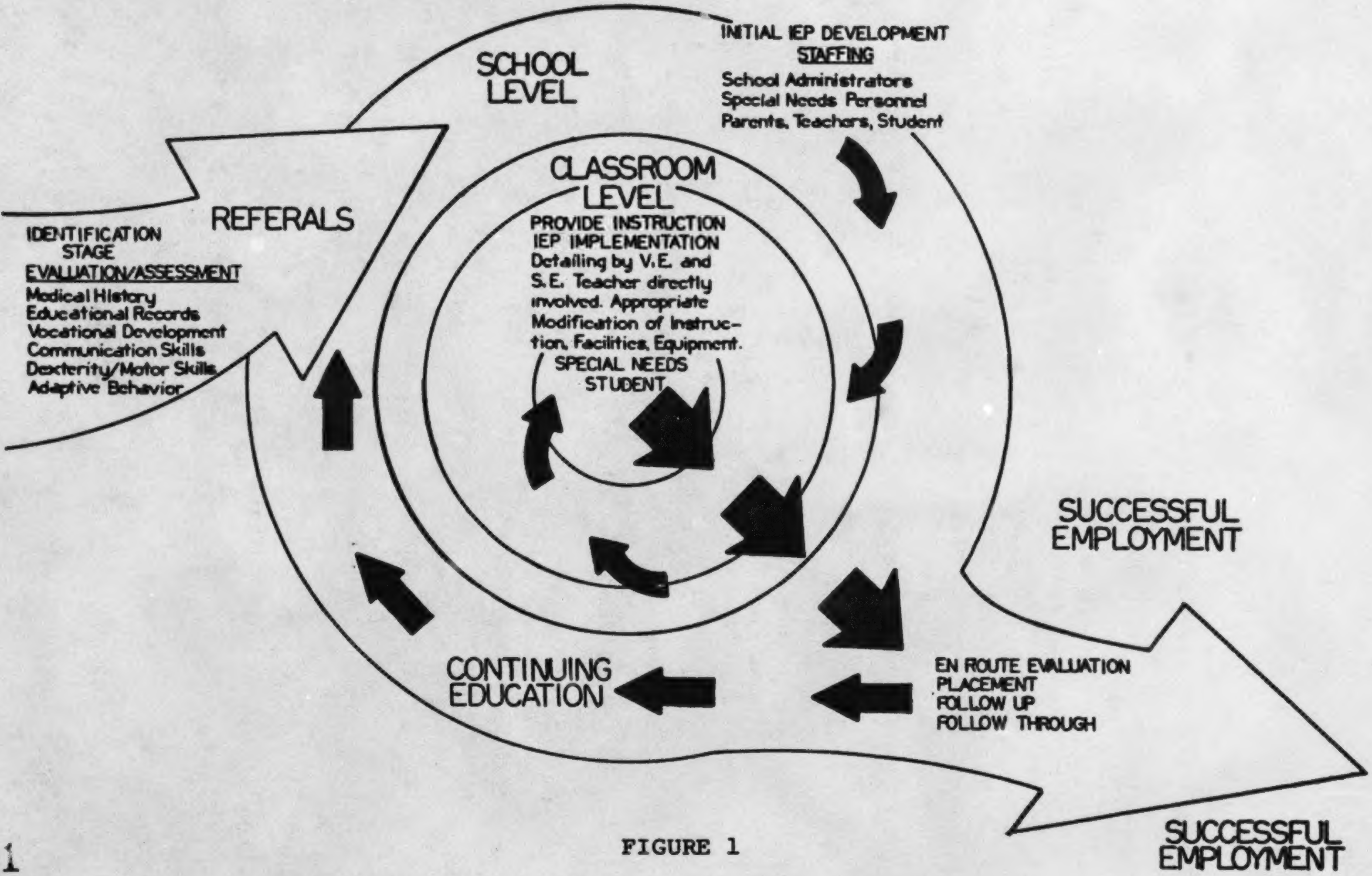

SCHOOL LEVEL
INITIAL IEP DEVELOPMENT
STAFFING
School Administrators
Special Needs Personnel
Parents, Teachers, Student
REFERALS
IDENTIFICATION STAGE
EVALUATION/ASSESSMENT
Medical History
Educational Records
Vocational Development
Communication Skills
Dexterity/Motor Skills
Adaptive Behavior
CLASSROOM LEVEL
PROVIDE INSTRUCTION
IEP IMPLEMENTATION
Detailing by V.E. and S.E. Teacher directly involved. Appropriate Modification of Instruction, Facilities, Equipment.
SPECIAL NEEDS STUDENT
SUCCESSFUL EMPLOYMENT
EN ROUTE EVALUATION
PLACEMENT
FOLLOW UP
FOLLOW THROUGH
CONTINUING EDUCATION
SUCCESSFUL EMPLOYMENT

FIGURE 1

system level. This evaluation process consists of collecting and assessing the following data for each student:

- -Medical History
- -Educational Records
- -Vocational Development
- -Communication Skills
- -Dexterity/Motor Skills
- -Adaptive Behavior

When this procedure has been completed, the system personnel refers the student to the appropriate school level personnel.

Development of the Plan

At the school level, an Individual Education Plan (IEP) is developed for each special needs student. An IEP is a written plan which describes the educational objectives, both long and short term, and the support services for a special needs student. The plan is developed by the school administration, special education personnel, teacher(s) directly involved with the student and the parent(s). In some cases, the student may help with the development.

Implementing the I.E.P.

The actual implementing of the I.E.P. begins at the classroom level. The purpose of the teacher dealing with the special needs student is to help the student set realistic goals, identify the barriers which make it difficult for the student to learn and adapt the curriculum and/or facilities with reference to the I.E.P. so the student can learn while overcoming personal barriers.

Special needs students have problems which hinder their learning. Therefore, a teacher's job becomes more complicated than when teaching "regular" students. Handicapped students may have a variety of problems - mental, physical and/or emotional.

Academically disadvantaged students may exhibit language deficiencies, reading and writing deficiencies, computational deficiencies and general educational deficiencies. Economically disadvantaged students may possess an inability to concentrate because their primary needs - food, shelter, clothing - are not adequately met due to lack of money.

By considering these problems, teachers can modify existing programs to accommodate the needs of special needs learners. Some suggestions which may prove beneficial in modifying an existing curriculum are listed below:

- Prepare instructional materials in greater detail and assign work in shorter units.
- Provide more frequent evaluation of student's progress and provide opportunities for remedial work.
- Be aware of the student's limited vocabulary.
- Be aware of the student's inability to understand abstractions and generalizations and prepare materials accordingly.
- Keep the student aware of his or her progress and make the student feel he or she can succeed.
- Use real teaching aids, live work and practical experiences whenever possible.
- Choose reading material which is at the student's level, interest and experience.
- Use constructive criticism only.
- Use peer instruction whenever possible.
- Allow the student to advance at his or her own pace.
- Use the part-to-whole learning concept in adapting materials.

Materials Which Can Be Used to Teach Disadvantaged

In Georgia an effective set of materials has been developed to be used with a program to help disadvantaged students adjust to life and work situations. This program is called CVAE or Coordinated Vocational Academic Education. The CVAE program is organized with a coordinator who is responsible for the type of instruction the students receive, and a team of teachers assigned to the coordinator who work cooperatively to help the disadvantaged students learn to enjoy school and become more successful students. CVAE materials include visuals in the form of synchronized slide/tape presentations. These units are designed to help the disadvantaged student become more successful in school, learn good work habits, become an aware consumer, and develop a better self-image and appearance. (Although designed especially for disadvantaged students, CVAE may also be used in regular classroom situations). The vocational education teacher should work with the CVAE coordinator to design a program of study for the disadvantaged students in areas in which the student needs help.

In some cases, facilities, must be modified for handicapped special needs students. In general, as long as the classroom/shop meets federal guidelines for barrier free design, extensive facility changes need not be made. For visually impaired students, for example, let the student locate in the classroom where he or she can see best even to the point of moving the desk or work station as a portable unit. In the case of orthopedically handicapped, some changes may have to be made to shop machinery to allow the student to use it. This may involve more convenient controls or special seating where the student would normally stand. In making these changes, special education expertise would be helpful.

Evaluation

Evaluation of the student's program should consist of:

- -En-route evaluation (formative) to monitor the student's progress through the program.
- -Summative evaluation upon completion of the program to determine job readiness.
- -Follow-up after placement to determine if the student is successful on the job.
- -Follow-through activities designed to identify any further training needed, which is indicated by the follow-up procedure.

Working with special needs students is much more demanding of the system, the school and the classroom teacher. However, with their patience and understanding, special needs students can not only succeed, but in many cases excell.

RESOURCES

To aid the teacher in modifying materials for special needs categories, the following references are listed by category. These are suggested references only as a world of materials exist on this subject.

Mentally Retarded

A Curriculum Guide for Teachers of Educable Mentally Retarded. Danville, Ill.: The Interstate Printers and Publishing Co., Inc.

High, Elizabeth C., and Moyers, Kathy L. Training Manual: Developing Pre-Vocational/Vocational Skills in Developmentally Disabled Persons. Washington, D.C.: Job Development Laboratory, George Washington University, 1976.

Kolstoe, Oliver P. Teaching Educable Mentally Retarded Children. Holt, Rinehart and Winston, 1976.

Mulligan, Robert E.; Gavin, Donald and Conaley, James. Comprehensive Career Education Curriculum Guide for the Trainable. New Brunswick, N.J.: Rutgers Vocational-Technical Curriculum Laboratory, 1977.

Introduction to Vocations for Educable Mentally Retarded. New Jersey: New Jersey Department of Education.

State of Ohio Curriculum Guide for Moderately Retarded Learners. Columbus, Ohio: Ohio Department of Education, 1977.

Tucker, Mark M. Learning through Curriculum Modification; A Blueprint to Teaching the Mentally Retarded. Johnstown, PA.: Mafex Associates, Inc., 1976.

Watson, Marjorie. Mainstreaming the Educable Mentally Retarded. Washington, D.C., NEA, 1975.

Hearing Impaired

Alvin, Howard P. The Evolution of an Evaluation Design for Evaluating Secondary Programs for the Deaf in Vocational Occupational-Technical Education (VOTE) Programs. ERIC - ED 123-241.

Guidelines: Educational Planning for the Hearing Handicapped. North Carolina Public Schools. Division for Exceptional Children, North Carolina Department of Public Instruction, Raleigh, N.C., 1977.

Munson, Harold L.; Eglston, Judy Cobb and Phillips, Gordon B. Career Education for Deaf Students: An Inservice Leader's Guide. University of Rochester, College of Education, Center for the Study of Helping Services, Rochester, N.Y. 1975.

Nix, Gary W. Mainstreaming Education for Hearing Impaired Children and Youth. Grune and Stratton, 1976.

Orthopedically and Other Health

A Model Plan for a Cooperative Vocational Rehabilitation Program. Office of Human Development, Rehabilitation Services and Administration. Department of Health, Education and Welfare, Washington, D.C.

Mallix, Kalisanker and Mueller, Jim. Vocational Aids and Enhanced Productivity of the Severely Disabled. The George Washington University Rehabilitation Research and Training Center, Washington, D.C. 1975.

McCarthy, Henry and Smart, Landon. Recommendations for Enhancing Employment Prospects of Handicapped Individuals. Comps. Human Resources Center, Albertson, L. I., 1978.

Duncan, John, et al. Environmental Modifications for the Visually Impaired: A Handbook. Visual Impairment and Blindness, December 1977, p. 442-455.

Disadvantaged

Guidelines for Methods and Techniques of Teaching Disadvantaged Students. Division of Vocational Education, Virginia Polytechnic Institute and State University, Blackburg, VA.

A Handbook for Developing Programs and Services for Disadvantaged Students. Department of Vocational Education Studies, College of Education, Southern Illinois, University of Carbondale, Carbondale, Ill. 62901

By Program

Adaption of Home Economics Curricula for Special Needs. North Dakota Research Coordination Unit, State Board for Vocational Education, State Office Building, Bismarck, ND.

Auto Body: An Adaptive and Developmental Program for Special Needs Students. Vocational-Technical Curriculum Laboratory, Rutgers - The State University, New Brunswick, N.J. 1976.

Floriculture Board of Cooperative Educational Services of Nassaw County, Division of Occupational Education, Division of Special Education, Westburg, NY 1975.

Grubb, Francine. Basic Business - A Teacher's Guide to an Employment Orientation Course for Special Needs Students. Vocational Technical Curriculum Laboratory, Rutgers - The State University, New Brunswick, N.J. 1976.

Home Economics and the Exceptional Student: A Handbook for Home Economics Teachers Working with Mentally Retarded Students. Vocational-Technical Curriculum Laboratory, Rutgers - The State University, New Brunswick, N.J. 1976.

Troutman, Carol M. Introduction to Office Occupations. Vocational-Technical Curriculum Laboratory, Rutgers - The State University, New Brunswick, N.J. 1974.

Working with the Handicapped in the Vocational Home Economics Classroom. Division of Vocational Education, State of Ohio, Columbus, Ohio.

Coordinated Vocational Education and Training (C.V.E.T.) manuals for disadvantaged, available from: Oklahoma State Department of Vocational and Technical Education, Curriculum and Instructional Materials Center, 1515 West Sixth Avenue, Stillwater, Oklahoma 74074.

-CVET Construction 3100219 Teacher's Guide
3100209 Student

-CVET General Mechanics 3100239 Teacher's Guide
3100229 Student

General Special Needs

A Handbook for Modifying Vocational Curricula for Handicapped Students. Wisconsin Vocational Studies Center, University of Wisconsin, Madison, May 1980.

Bottoms, J.E. and Scott, C.P. Supportive services for special student groups. In J.E. Wall (ed.), Vocational Education for Special Groups. Sixth Yearbook, Washington, D.C.: American Vocational Association, 1976.

Gill, Douglas H. and Scott, C. Paul. A practical model for mainstreaming handicapped learners in vocational education. The Journal for Vocational Special Needs Education, Vol. 1, No. 3, April, 1979, pp. 3-7.

Gugerty, J., et al. Tools, Equipment and Machinery Adapted for the Vocational Educator and Employment of the Handicapped. Project #498749006, Wisconsin Vocational Studies Center, Madison, Wisconsin, January 1981.

Hull, Marc E., Berry, Owen J. and Clark, Donald L. Procedures for Teaching Vocational Concepts to Students with Special Needs. Texas A & M University, Final Report Project 62350274, June 1976.

The Related Vocational Instruction Program. Georgia's Approach to Vocational Education for the Handicapped at the Secondary level, Douglas H. Gill, Project Coordinator, Vocational Programs for the Handicapped, Georgia Southern College, Statesboro, Georgia.

Vocational Educational Resource Materials, A Bibliography of Materials for Handicapped and Special Education. Third edition, 1978. Wisconsin Vocational Studies Center, University of Wisconsin - Madison.

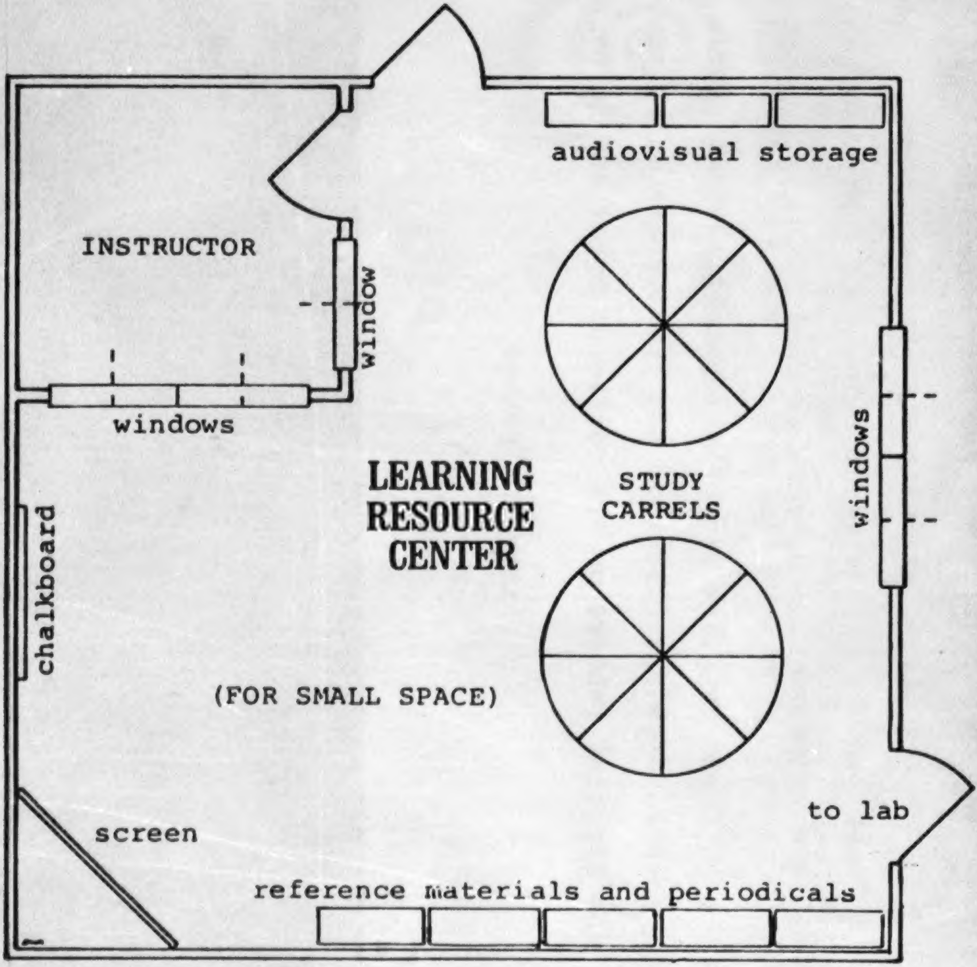
SECTION IX

FACILITY LAYOUT

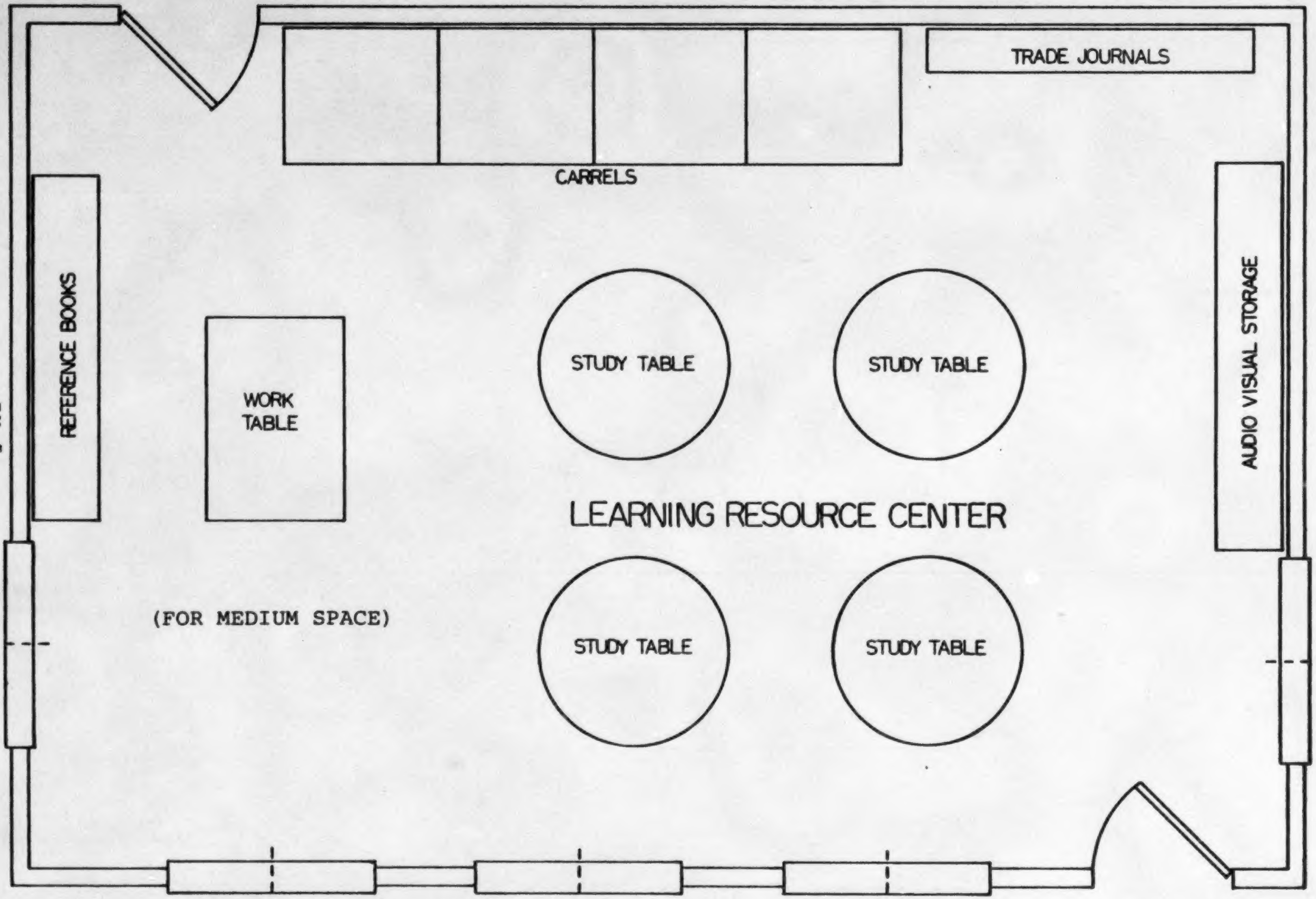
Facility Layout

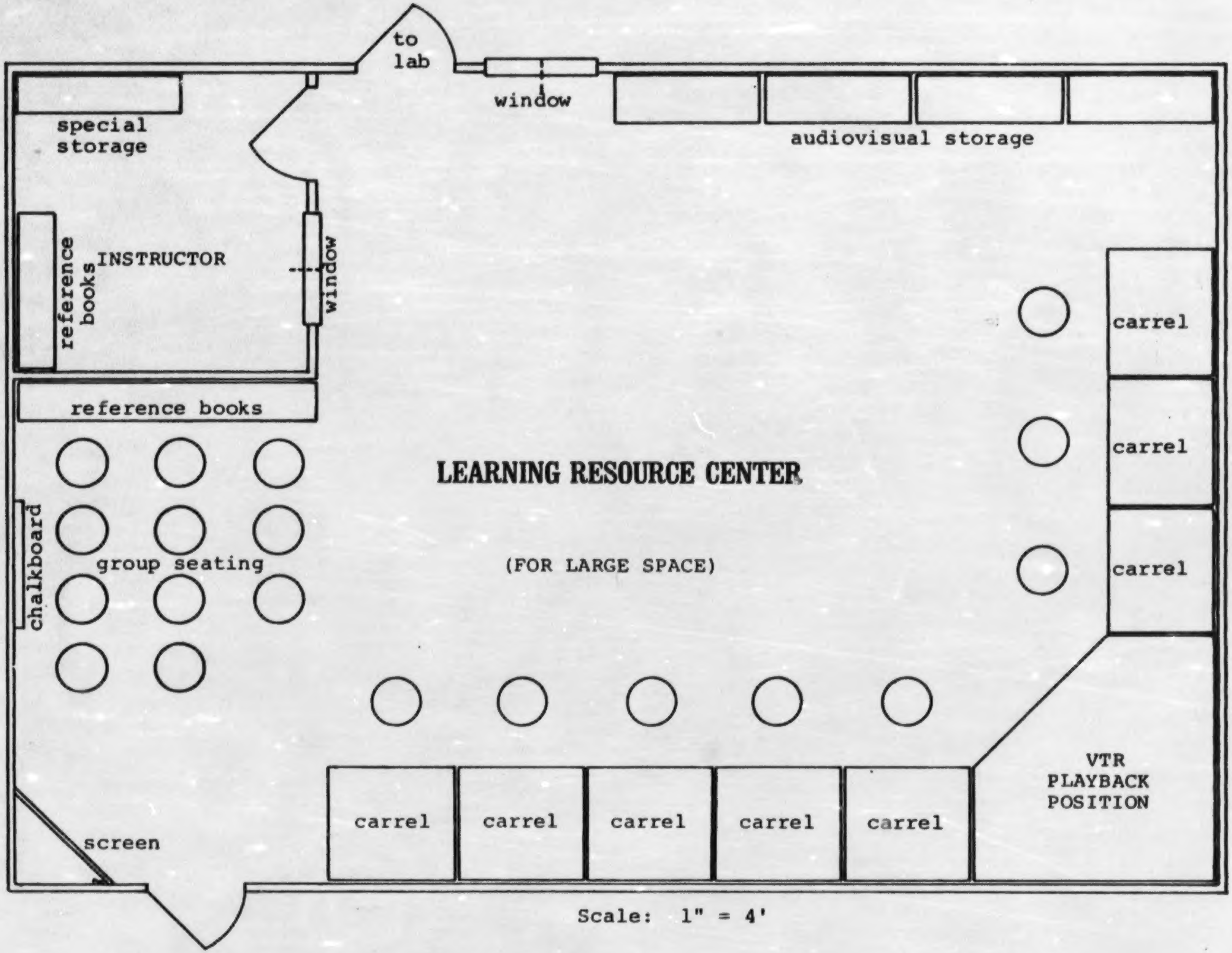
The facility layouts on the following pages are presented to aid in arranging the classroom and laboratory for efficient instruction. One facility layout and three resource center arrangements are presented. Ultimately, however, the instructor must determine an arrangement that best fits the needs of the students and the instructional method being used.

The laboratory facility layout is taken from a successful masonry program in Georgia. The facility should be easily adaptable to a variety of arrangements that will best fit local needs. These layouts may be especially useful in those schools where classroom renovation or construction is being planned.

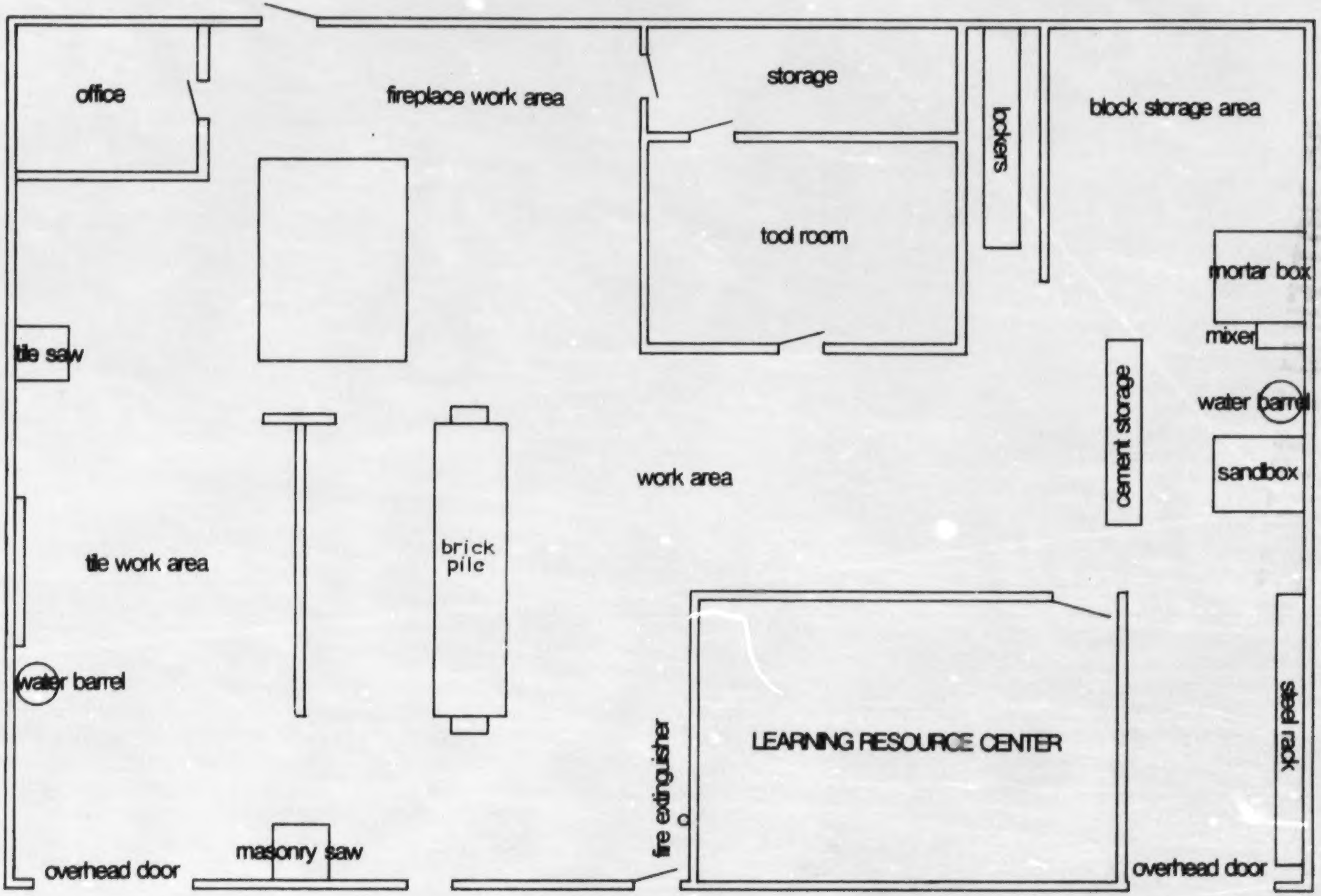

audiovisual storage
INSTRUCTOR
window
windows
LEARNING RESOURCE CENTER
STUDY CARRELS
windows
chalkboard
(FOR SMALL SPACE)
to lab
screen
reference materials and periodicals

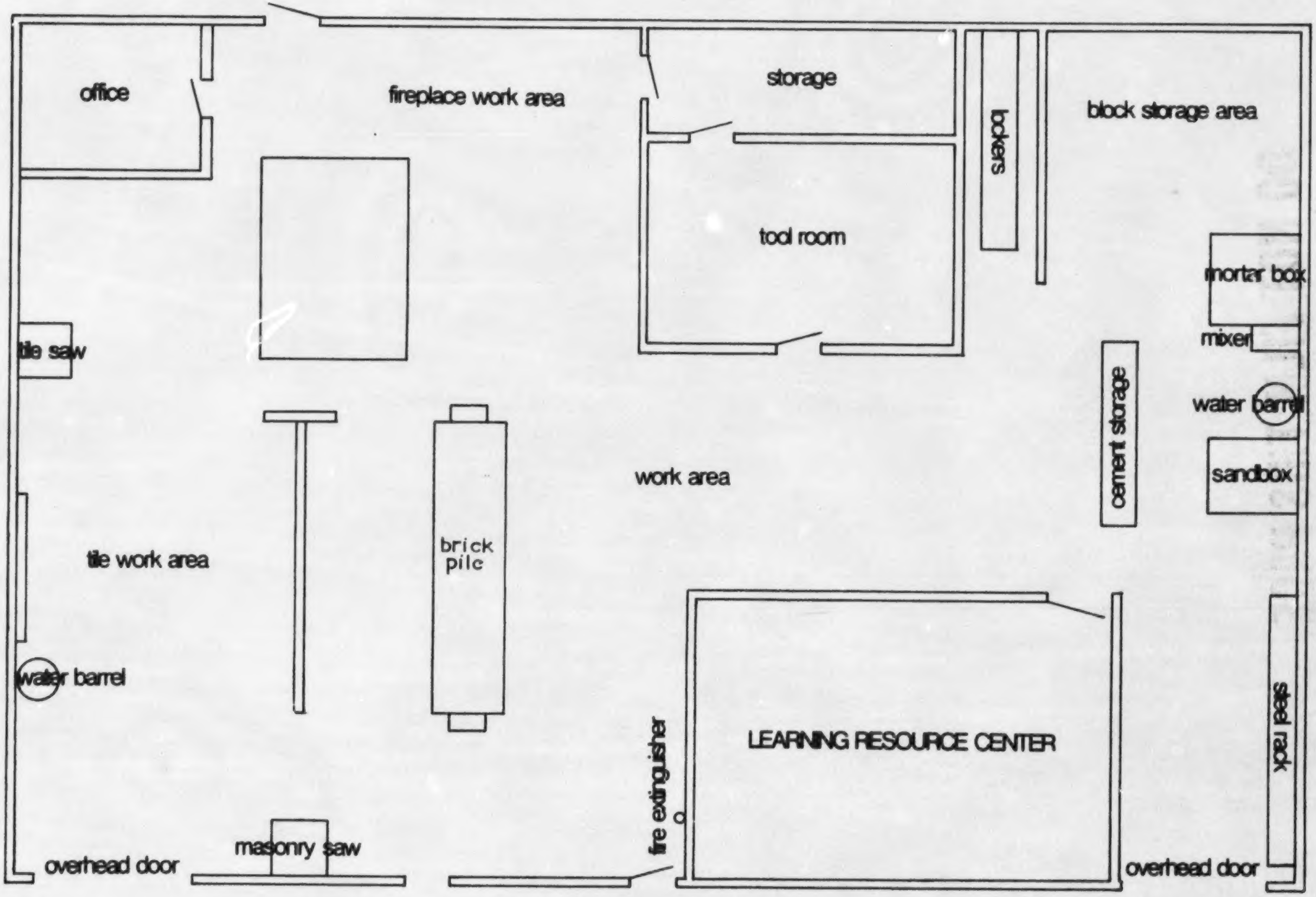
Scale: 1" = 4'


TRADE JOURNALS
CARRELS
REFERENCE BOOKS
WORK TABLE
STUDY TABLE
STUDY TABLE
AUDIO VISUAL STORAGE
LEARNING RESOURCE CENTER
(FOR MEDIUM SPACE)
STUDY TABLE
STUDY TABLE


to lab
window
special storage
audiovisual storage
reference books
INSTRUCTOR
window
reference books
LEARNING RESOURCE CENTER
(FOR LARGE SPACE)
chalkboard
group seating
carrel
carrel
carrel
VTR PLAYBACK POSITION
screen
carrel
carrel
carrel
carrel
carrel

Scale: 1" = 4'


office
fireplace work area
storage
lockers
block storage area
tool room
mortar box
mixer
tile saw
water barrel
cement storage
sandbox
work area
brick pile
tile work area
water barrel
LEARNING RESOURCE CENTER
steel rack
fire extinguisher
masonry saw
overhead door
overhead door


office
fireplace work area
storage
lockers
block storage area
tool room
mortar box
mixer
tile saw
water barrel
cement storage
sandbox
work area
brick pile
tile work area
water barrel
LEARNING RESOURCE CENTER
steel rack
fire extinguisher
masonry saw
overhead door
overhead door

SECTION X

DEFINITION OF TERMS

DEFINITION OF TERMS

1. AV's-Audiovisuals - May refer to any picture and/or sound media. (ie. slides, tapes, filmstrips, 16 mm films, etc.)

2. Checkpoint - A student-instructor interface point wherein the instructor may give the student a test, perform a demonstration, or simply provide the student with additional needed information or instructions. Also a checkpoint may be used for motivational purposes.

3. Competency - The ability (knowledge, skills and attitudes) to perform all of a group or cluster of related tasks required to complete a designated activity according to occupational standards. In the educational setting the statement of a competency includes expected student outcomes in terms of knowledge, skills, and attitudes required to complete a designated activity as defined by incumbent workers according to the standards of the work place.

4. Course - A grouping of tasks and competencies which have a common knowledge base or are within a given domain.

5. Criterion-Referenced Measure - An exercise based upon a performance objective, the accomplishment of which measures attainment of that objective.

6. Criterion-Referenced Test - A test designed to measure student competencies based on job or industrial standards.

7. Curriculum Guide - A document containing the objectives, content, organization, and structure of an instructional program. It is designed for use by administrators, instructional supervisors and teachers.

8. D.O.T. - Abbreviation for Dictionary of Occupational Titles. Document provides nine digit codes identifying each occupation.

9. Duty - One of the distinct major activities involved in the work performed, comprising related tasks.

10. Exit Point - A predetermined point within an instructional program in which a student may exit with the essential competencies for a specific job. Usually defined in terms of D.O.T. codes and/or O.E. codes.

11. "Hands-On" - Statement implying the student is physically involved in a learning activity.

12. Individualized Instruction (I.I.) - A system of instruction allowing for a student to progress at their fastest rate.

13. Job - A specific area of specialization within an occupational field consisting of several closely related duties for which a person would expect to receive remuneration. Should be identified by DOT code.

14. Job Sheet - (Or Operations Sheet) - A project of a performance nature. Generally performed by the student in a lab or shop type environment or in a specialized work area.

15. Live Work - Generally refers to items brought into the course area for repair or adjustment. Examples of live work might be automobiles, radios and TV's, air-conditioners, etc. Another form of live work would be patrons visiting the cosmetology department to receive permanents or other services.

16. Master Copies - Original copies of slides, tapes or written materials set aside for the purpose of duplication.

17. Occupational Cluster - A group of occupations sharing a common core of competencies. Georgia's comprehensive high school vocational program is organized around this concept.

18. Occupational Inventory - A listing of tasks to be performed in a particular occupational area, grouped under duty classifications.

19. O.E. - Refers to the U. S. Office of Education. O.E. codes are a classification system (taxonomy) for occupational education programs.

20. Open Entry - Term meaning that a student may enter the program at any time and does not have to wait for quarter or semester breaks.

21. Open Exit - Term meaning that a student may leave a program any time he/she completes their occupational objective.

22. Performance Guide - A series of steps, arranged in a sequence ordinarily followed, which when completed may result in the performance of a task. Also called "teaching steps."

23. Performance Objective - A statement in precise, measurable terms of a particular behavior to be exhibited by a learner under specified conditions. It possesses each of the elements or characteristics specified below:

    a. Condition - The testing situation confronting the learner is clearly specified. This includes equipment provided or withheld, environmental constraints such as temperature, space, etc.

b. Performance - The specific behavior expected of the learner is stated.

c. Standard - The degree of acceptable performance is specified.

24. Performance Test - A test entailing not only the ability to answer questions, but measuring the students' ability to operate, manipulate, or perform a given task as well.

25. Program - An organized sequence of courses leading to an occupational objective. A program may contain one or more student exit points as defined by D.O.T. codes.

26. Program Objective - The outcome of a prescribed program of instruction. Usually expressed in terms of the occupation or job for which training is designed. D.O.T. codes are frequently used to identify program objectives or student exit points.

27. Self-Paced - Refers to a student moving through the prescribed training program at the fastest pace at which the student can meaningfully learn.

28. Sequencing - Putting any set or series of learning activities or tasks into proper order or sequence. Normally arranged from the simple to complex within groupings or blocks.

29. Software - Written or printed materials, slides, filmstrips, tapes, etc.

30. Student Manual - A document designed for use by students in a specific instructional program. It contains unit sheets, references, operational procedures or job sheets, etc.

31. Task - The smallest division of work in which a measurable output occurs. A logical and necessary step in the performance of a duty.

32. Task List - A listing of tasks performed by incumbent workers within a domain of interest. An example is a listing of all tasks performed by an automotive mechanic or by a worker in ornamental horticulture.

33. Unit - One "module" training materials; generally covering one learning task and programmed on one Unit Sheet. May cover more than one lesson.

34. Unit Guide - A curriculum guide sheet that lists a task and objective with the instructional activities, instructional materials, evaluation and approximate time required for a student to successfully complete the task.

35. V-TECS Catalog - A comprehensive collection of performance objectives, performance guides, criterion-referenced measures, and related data, organized by a job structure or career ladder within a domain of interest.

Federal law prohibits discrimination on the basis of race, color or national origin (Title VI of the Civil Rights Act of 1964); sex (Title IX of the Educational Amendments of 1972 and Title II of the Vocational Education Amendments of 1976); or handicap (Section 504 of the Rehabilitation Act of 1973) in educational programs or activities receiving federal financial assistance.

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The following individuals have been designated as the employees responsible for coordinating the department's effort to implement this nondiscriminatory policy.

Title II - Loydia Webber, Vocational Equity Coordinator
Title VI - Peyton Williams Jr., Associate Superintendent
of State Schools and Special Services
Title IX - Evelyn Rowe and Myra Tolbert, Coordinators
Section 504 - Jane Lee, Coordinator of Special Education

Inquiries concerning the application of Title II, Title VI, Title IX or Section 504 to the policies and practices of the department may be addressed to the persons listed above at the Georgia Department of Education, State Office Building, Atlanta 30334; to the Regional Office for Civil Rights, Atlanta 30323; or to the Director, Office for Civil Rights, Education Department, Washington, D.C. 20201.